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FALSE AND TRUE SENEGA.

By Geo. Goebel, Jr.

From an Inaugural Essay.

A root designated as "Southern Senega" has been lately introduced and sold in place of true senega. As Polygala senega is one of the most valuable American drugs, it is of great importance that it should not be displaced by a new variety without a knowledge of its medicinal properties and constituents, as compared with the true senega; therefore the writer has undertaken a comparative microscopic and physical examination of the two varieties, with a chemical analysis of the medicinal constituent.

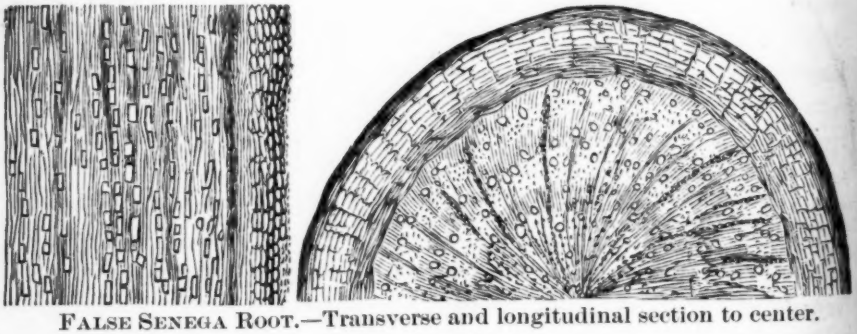
The false senega as met with in commerce is a root varying from a yellow to a lightish brown color, surmounted by a knotty head or crown of from a half to three-fourths of an inch in diameter, the knotty crown displaying numerous stem scars. Below this crown is found the root proper, which is from three to six inches in length, irregularly branched, cylindrical, tapering, longitudinally wrinkled, and breaks with a short fracture, displaying a brittle and readily removable bark, which constitutes about one-fifth of the bulk of the root. It is difficult to reduce to a fine powder on account of the hardness of the woody portion, the powder being sternutatory and of a very light straw color. The drug when masticated causes coughing and a painful sensation in the fauces.

All efforts to trace its exact habitat, or procure a plant, so far, have proven fruitless; the only information that could be elicited was that it came from the Southern States.

Greenish, in 1878, described a Polygala which corresponds with this false senega, and, after having made a histological examination, pronounced it true senega, but young and immature. This statement of Greenish is erroneous, as all true senega, whether young or old, has

the characteristic keel-like projection and the irregularly formed woody tissue.

The true senega is of from a light to a dark brown color, surmounted by a very knotty head or crown of from a half to one and a quarter inch in diameter. The root proper is of from one-eighth to three-eighths inch in diameter at the upper part, is branched and tapering, of from two to five inches in length, and very much contorted, with a projecting, keel-like ridge, running the entire length of the root and rootlets in a spiral form. It is both longitudinally and transversely wrinkled, breaks with a short fracture, and exhibits a somewhat porous, rather firmly adhering bark, which varies in thickness of from one-third to one-fifth of the thickness of the root. The projecting keel disappears upon being boiled with water, and reappears when the root is dried. The woody portion is from a light yellow to almost a white color, and is in different places very irregular in shape, owing to a non-formation of portions of the woody tissue. The root is capable of being reduced to fine powder with greater ease than the false variety, the dust being very sternutatory; when chewed it produces a painful sensation in the throat and excites coughing.



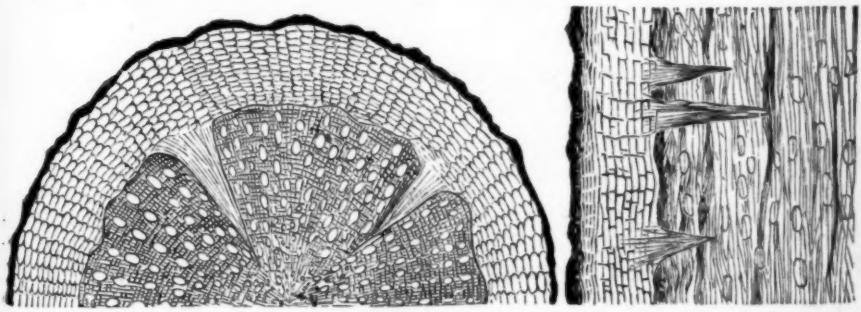
FALSE SENEGA ROOT.—Transverse and longitudinal section to center.

The false senega, when cut transversely, exhibits an outer layer of cells, rather irregular, very compact, thin and corky; the inner bark is about five or six times as thick, its cells are very regular and appear in distinct circles, varying in size; the outer circle is formed of very small, flattened cells; the second, broader layer, consists of oval cells, and is followed by a zone of smaller slightly flattened cells, and by an inner circle of cells, nearly similar to the preceding. A very thin cambium layer separates the bark from the wood, which is rather

compact, with slightly curved numerous medullary rays, composed of small flat parenchyma cells; the woody cells are small, somewhat oval shaped, intermixed with larger ducts, of the same shape, arranged in three distinct circles.

In longitudinal section, the corky layer of the bark is rather irregular; in the next layer the cells are long and flattened, followed by somewhat larger oval cells, and then by long, flattened, very compact liber cells, and finally by shred-like, very compact cells, and by the thin cambium. The wood is composed of prosenchyma tissue, with large ducts.

The true senega, when transversely cut, exhibits a bark with a very thin corky layer, and consists of hexagonal cells, forming three layers, the cells of the inner layer being much smaller in size. Inside of the thin cambium layer is the radiating woody portion, composed of wood cells and hexagonal ducts, arranged in straight lines, occasionally in pairs, and about four times as large as the adjoining cells.



SENEGA ROOT.—Transverse and longitudinal section to center.

In the longitudinal section are seen the thin corky layer, the somewhat loose-celled middle bark, the dense inner bark containing elongated cells, the thin cambium, and the compact wood with large ducts.

Polygalic acid, being the active constituent in senega, the writer's experiments have been chiefly directed to the elimination of that principle in the two drugs.

Ten troyounces of the false senega were treated as directed by Procter, in the "American Journal of Pharmacy," 1860, page 150. The powder was exhausted by percolation with a mixture of two parts of alcohol and one of water until the percolate was free from taste and ceased to give a precipitate with basic acetate of lead. This percolate

was evaporated by a water-bath to three fluidounces. During the evaporation, when the liquid reached the temperature of 158°F., it became opaque, and at 167°F. a flocculent precipitate was produced, which was filtered off, and it appeared to be albuminoid. The evaporated liquid was repeatedly shaken with fresh portions of ether, until the latter ceased to acquire color. This required fourteen fluidounces. The syrupy liquid remaining was mixed with twelve fluidounces of alcohol, and four fluidounces of ether to precipitate the polygalic acid, which is insoluble in this menstruum. The precipitate so formed was filtered off, and proven when treated with Fehling's solution to be glucose, the polygalic acid remaining in solution.

Another portion of the drug was treated by a modification of Quevenne's process; it was exhausted, first with stronger alcohol, the percolate evaporated to three fluidounces, and mixed with an equal bulk of distilled water; a light yellow precipitate of a resinous character was produced, which when filtered from the solution was found to be soluble in ether, stronger alcohol and solution of potassa. The remaining liquid was treated with solution of basic acetate of lead until a precipitate ceased to be produced; the precipitate so formed was filtered off, suspended in distilled water, and decomposed by hydro-sulphuric acid; the filtered liquid was evaporated by means of a water-bath, when the polygalic acid remained as a brownish powder; it was then well shaken with ether, to remove adhering coloring matter; the ether was decanted, leaving the polygalic acid as an amorphous light yellowish powder. The amount of acid thus obtained was two per cent.

The remaining drug was now treated with dilute alcohol until two pints had passed; this was evaporated to four fluidounces, precipitated with solution of basic acetate of lead, the precipitate filtered off, suspended in water and decomposed by sulphuretted hydrogen,[1] and the filtered liquid evaporated to dryness, leaving polygalic acid to the extent of one per cent., making a total of three per cent. of polygalic acid in this false senega.

Procter's process, when applied to true senega, yielded five per cent. of acid, while Quevenne's process gave five and a quarter per cent. Procter's process, being less complicated, is preferable for the manufacture of polygalic acid from true senega.

[1] The sulphide of lead is stated by Quevenne to retain a portion of the polygalic acid, and on that account requires to be treated with hot alcohol. —EDITOR.

Polygalic acid so obtained is somewhat contaminated with glucose, from which it is very difficult to separate on account of their similar solubilities. Polygalic acid is insoluble in ether, chloroform, slightly soluble in alcohol, soluble in dilute alcohol and water, also in boiling alcohol, but separates to some extent upon cooling. Besides the acid, both drugs were found to contain, in varied quantities, tannin, glucose, pectin compounds and resin.

The pharmaceutical preparations made from the two roots were as follows:

Preparation.	From false senega.	From true senega.
Decoction, U. S. P.	Light straw color; weak senega odor; nearly insipid.	Deep straw color; strong odor and taste of senega.
Infusion, Br. P.	Like preceding.	Similar to preceding.
Fluid extract, U. S. P.	Transparent, dark sherry color; senega odor, somewhat modified.	Dark brown; odor nauseous; taste sweetish, then strongly acrid; excites coughing.
Syrup, U. S. P.	Yellowish-brown; slight odor and taste of senega.	Deep brown or wine color; senega odor and taste prominent.
Comp. Syrup, U. S. P.	Light yellowish-brown; slight odor and taste of senega.	Reddish-brown; odor and taste of senega well marked.
Tincture, Br. P.	Light golden-yellow; odor and taste of senega prominent.	Dark golden-yellow; strong senega odor, and characteristic taste.

The preparations of the true senega required the following amounts of diluents to obtain a color corresponding with that of the same preparation of the false root: decoction, 36 per cent. water; infusion, 40 per cent. water; fluid extract, 40 per cent. alcohol; syrup and compound syrup, 34 per cent. syrup; tincture, 30 per cent. alcohol and water.

Phytolacca Decandra.—A. Terreil has found in the alcoholic extract of the berries the potassium salt of a new acid, *phytolaccic acid;* the aqueous solution of this salt is not changed by hydrochloric acid in the cold, but when heated a stiff jelly is produced which is soluble in strong alcohol. The isolated acid is amorphous, yellowish-brown, transparent, non-deliquescent, very soluble in alcohol and water, does not precipitate salts of the earths, but on boiling reduces silver salts. Its aqueous solution is converted into a jelly by strong acids; its alkaline salts are not crystallizable.—*Compt. rend.*, xci, pp. 856–858.

GLUCOSE AS AN EXCIPIENT FOR PILL MASSES.

By Peter W. Lascheid, Ph.G.

From an Inaugural Essay.

A series of experiments were made, not in search for a universal excipient, but with a view of determining the comparative value of some of the most prominent excipients recommended. The excipients used were: 1, glycerite of starch; 2, glycerite of tragacanth, made with 1 part of the gum to 8 parts of glycerin, and 3, glucose, the latter having been mentioned by Prof. Remington in his lectures.

Vegetable powders are not unfrequently prescribed in conjunction with an extract, serving as an excipient, and if the mass be too hard or too soft water or a dry substance is added for obtaining the proper consistency. When no excipient is ordered, the use of glucose will give entire satisfaction, requiring less time and less labor than the other excipients, and adding but little to the bulk of the pill as compared with the other excipients.

To make a pill mass of powdered *rhubarb* 18 parts and glucose 10 parts, or glycerite of tragacanth 9 parts, required about the same time and labor, but with glycerite of starch 10 parts, more labor was necessary. On testing the pills with water those made with glucose were completely disintegrated before any visible effect was shown upon those made with the other excipients.

Pilulæ aloes, U. S. P., are sometimes prescribed to be made without soap. Glucose forms with aloes an excellent pill mass, yet it cannot be recommended for the purpose, as the pills are less readily soluble, requiring five times the length of time for solution. For 12 grains of aloes 4 grains of glucose and 2 drops of water were used.

Vegetable powders and salts are, with more or less difficulty, made into suitable pill masses. When the salts are in excess, Hager recommends the use of bread, which, however, greatly increases the size of the pills. Ferri sulphas and pulv. glycyrrhizæ *aa* gr. x were made into pills with glucose gr. ix, glycerite of tragacanth gr. vi and with glycerite of starch gr. viii; the last-mentioned excipient is the least desirable, since the mass suddenly softens. In this case glucose is to be preferred as a useful excipient; the pills made with it were completely disintegrated three minutes before the water had any effect upon those made with the other excipients.

Pill masses consisting of Ferri sulphas, Potassii carbonas and Pulv.

aloes socotr. *aa* gr. x were made, using 6 grains of glucose and 5 grains of the glycerites, respectively. The latter became quite hard in a short time. Immersed in water, those made with glucose and glycerite of starch were disintegrated in about the same length of time, while 1½ hour additional time was required for those containing tragacanth.

Resins and Gum Resins.—The trituration of these substances with alcohol, as recommended by Hager and others, does not give the best results, too much time and patience being required for obtaining the proper consistency. In most cases the mass is readily formed with glucose, which seems to have the effect of softening the substance. Guaiacum resin, however, is an exception, since too much time is necessary for forming a pill mass with glucose; but the addition of a minute quantity of tragacanth aided the operation in a marked degree. For Resina guaiaci gr. xxiv, 16 grains of glucose and 15 grains of glycerite of starch were used, the latter requiring the addition of a little powdered liquorice root. Both kinds of pills, after remaining in water for 12 hours, had separated into particles floating in the water.

Mastiche gr. xxiv yields, with 16 grains of glucose, a very satisfactory result, the pills being of a clear, pale yellow color when finished. When glycerite of starch was used, a little tragacanth had to be added; but glycerite of tragacanth did not give a satisfactory result (also not with resin of guaiacum). The mastic pills with glucose were completely disintegrated in 5 minutes, those with glycerite of starch in 15 minutes.

In Pilulæ aloes et asafœtidæ, U. S. P., the soap (32 grs.) can be advantageously replaced by glucose (24 grs.) when rapid solubility is a point of consideration, the latter dissolving in one-half the time necessary for those made with soap.

Glucose may also with advantage be substituted for the syrup in the formula for Pil. galbani comp., U. S. P.

Cinchona Alkaloids.—Of the numerous excipients heretofore recommended glycerin is probably the best for the production of an elegant *white* quinia or cinchonidia pill, but a comparative trial will prove, both as regards manipulation and appearance, that glucose is superior. For Quiniæ sulphas gr. vi, 3 grains of glucose, and for Cinchonidiæ sulphas gr. xii, 5 grains of glucose were used. The pills are made readily in less time, and are of smaller size than when made with most other excipients.

Quinia sulphate and exsiccated ferrous sulphate, of each 6 parts, were made into pills, using in the one case 5 parts of glucose, and in

the other 4 parts of a mixture of glucose and glycerin. The former pills were completely disintegrated in less time than those made with the mixture.

The author had formerly regarded glycerite of tragacanth as the most useful excipient, but his experiments convinced him of the superiority of glucose in most cases, which also served the purpose admirably with a number of substances that had previously occasioned more or less difficulty, particularly mixtures of aloes and exsiccated ferrous sulphate, quinia sulphate and sodium salicylate, calomel and prepared chalk, tannin and opium, lead acetate and opium, and others. In all these cases the pills made with glucose were readily dissolved or completely disintegrated.

PROPERTIES AND USES OF ACAROID RESIN.

SYRACUSE, N. Y., June 13, 1881.

Editor of the American Journal of Pharmacy:

DEAR SIR—The articles on the Xanthorrhœa Resins, page 217, and on Acaroid Resin, page 283 of this year's JOURNAL, recalled to my mind very vividly the instructions of my valued teacher, Dr. Wm. Tully, of New Haven, Conn., who, at the time of my medical pupilage, thirty-five years ago, had recently resigned the chair of Materia Medica and Therapeutics in the Yale Medical College. I have looked up the notes of the private course of lectures he gave me, and find some matters that I think will be interesting to your readers.

Besides some of the synonyms given in your article, page 217, Dr. Tully gives Gummi-resina lutea, Gummi flavum, Yellow gum and Gum lac of the ground (Tasman). Of the plant Zanthorrhœa Hastile[1] he gives the synonyms Acarois resinifera (Phillips), Acoroides resinifera (Pharm. Mass.), Yellow resin tree (White), Botany Bay gum tree, Spear yellow gum tree (R. Brown), Grass tree. He remarks "that what appears to be the stem of the plant is botanically a root; the leaves are hence radical, and the peduncle a scape." The plant is figured in Lindley's "Vegetable Kingdom," page 203.

With regard to the medicinal effects of this resin Dr. Tully observes,

[1] I remember distinctly that Dr. Tully insisted that the specific name should be spelled with a capital, on the ground that it is a noun in the nominative case, in apposition with Zanthorrhœa, and not an adjective, qualifying the generic name.

"The operation that has been most prominently observed is the diminution of excessive and even colliquative secretions and excretions. It is not known that it possesses any expectorant, diuretic, diaphoretic or emmenagogue effects, nor have I observed any resolvent, cholagogue or antipsoric operations. Nor does it appear to be euphrenic" [exhilarant], "narcotic or antisbestic" [diffusible stimulant]. "From analogy with other resins I am inclined to think it is adenagic" [a term used by Dr. Tully, under precise definition, to denote the operation usually and vaguely called alterative], "but gradual and permanent in its effects, and bearing the same relation to other adenagics, that more quickly produce their effects, that tonics do to antisbestics" [diffusible stimulants]. "The operation of this article is, however, full as well and, indeed, better explained on the supposition that it is styptic as that it is adenagic. But it possesses none of the sensible properties of styptics. The diseases in which it has proved serviceable are capable of being relieved by adenagics and by styptics."

Dr. Tully mentions the following pharmaceutic preparations: Powder with loaf sugar, Pulvis cum saccharo purificato (dose, ℈i to ʒss); pills, made up of one part each of the powder and camphor, with eight parts of white soap; and the tincture made by macerating, for a week, four troyounces of the powder in a pint of alcohol (sp. gr. 0·835), and decanting from the undissolved residue.

Of the tincture he says: "This is a saturated tincture, dark brown or almost black, deep crimson by transmitted light. Its taste is slightly sweetish, slightly styptic (does this depend on the alcohol?), resembling the compound tincture of styrax benzoin. The medium dose is a fluidrachm four, six or eight times a day. An elegant draught may be made by adding a little essential oil, as of gaultheria, and syrup of sugar to the taste.

"*Therapeutic Applications.*—It is used in New Holland for dyspepsia. When dyspepsia is attended with anorexia, cardialgia, and tendency to diarrhœa, I have done much good with this resin. I consider it superior much to myrrh. It is more especially adapted to cases attended with diarrhœa gypsata. (Good.) In diarrhœa fusa, biliosa, mucosa and serosa this resin is useful. Moderate cases it will cure; severe and obstinate cases will require opium, likewise, in conjunction. I have known cases of idiopathic diarrhœa, which had gone on two or three weeks under doses of one grain of opium every two hours without being fully restrained, promptly cured by giving a fluidrachm of

the tincture of this resin with the opium (or not as often as the opium) for three days. I never knew this resin produce coprostasis. It has a tendency to relieve the nausea connected with diarrhœa and dysentery. In common cholera it is valuable as an auxiliary. According to Mr. Kite, common cholera, even when attended with convulsions, has been cured by this resin alone. I have seen cases of chronic nasal catarrh cured by this resin alone.

"In typhus nervosus, when attended with diarrhœa and vomiting" [perhaps typhoid fever is here meant], "it often surprisingly relieves these symptoms.

"I have seen great benefit from it in catarrhal phthisis. It is always a valuable auxiliary. I have used it in a great variety of cases of dysentery, and have seen more or less benefit in all.

"In intestinal flatulence I have seen it do good. It produces its remedial effects slowly and gradually, but certainly."

Dr. Tully also speaks of its use in vaginal leucorrhœa, gonorrhœa and profuse secretion of urine with incontinence. In conclusion he says:

"This resin was used in New Haven, Conn., by Dr. Eneas Munson and Dr. Eli Ives as early as 1803, and was finally relinquished by them from the belief that the resin of Larix americana possessed similar powers and was of equal value."

While a student of Dr. Tully's I procured a quantity of the Botany Bay resin from a druggist in New Haven. The drug was in clean lumps, of irregular shape, two or three inches in length, resembling on the outside gamboge, readily powdered, the powder being of a duller yellow than that of gamboge. I used it considerably in the early years of my practice, both in the form of powder and of tincture, principally in the treatment of diarrhœa, with good results. I finally discontinued its use, from the difficulty I experienced in getting a fair quality of the drug, the last specimen that I received, from a very reputable house in New York city, being mainly sticks and dirt, with little resin. I suppose the difficulty of procuring it was owing to the cessation of its importation.

I may add that the Dr. Tully mentioned is the one who first compounded the valuable powder of morphia, camphor, prepared chalk and licorice root, now pretty widely known as Tully's Powder.

Yours very truly, WM. MANLIUS SMITH.

THE STEAROPTEN OF BUCHU LEAVES.

By John M. Maisch.

Read before the Penna. Pharmaceutical Assoc. at Williamsport, June 15.

In a paper by Prof. E. S. Wayne, of Cincinnati, published in the "Amer. Jour. Phar.," 1876, p. 18, some interesting experiments are related concerning two crystalline substances obtained from oil of buchu by treatment with caustic soda and subsequent decomposition of the clear alkaline liquid with hydrochloric acid. The crystals yielded by the oil distilled from partially exhausted buchu leaves gave the reactions of salicylic acid, notably the deep purple color with ferric chloride. The crystals, however, yielded by oil distilled from 20 lbs. buchu gave with ferric chloride a blackish color, and the same reaction was observed by Prof. Wayne with crystals collected by Mr. Wm. M. Thomson, then of W. H. Merrell & Co. The last-mentioned crystals, I have since been informed by Mr. Thomson, were separated in the cooler during the distillation of weak tincture of buchu in the preparation of fluid extract, and Prof. Wayne obtained larger quantities of the same substance by distilling the nearly exhausted buchu leaves with water.

All these observations were made with short buchu leaves, presumably with the leaves of Barosma betulina, which for a number of years past constitute the great bulk of commercial short buchu. Having myself worked up, at different times, over 6,000 lbs. of buchu into fluid extract without ever observing a crystalline separation during the concentration and distillation of the weak tincture, I requested Mr. Thomson, now of Smith, Kline & Co., of Philadelphia, to inform me in case he should meet with a similar crystallization. This he did, about two months ago. I found the exit end of the worm surrounded with considerable of a crystalline efflorescence, and the upper side of the pipe, as far as could be reached with the finger, covered with more perfect crystals, giving, like the inflorescence, a blackish color with ferric chloride, and this reaction was also obtained with the distillate, which was neutral to test paper. There cannot be any doubt, as Mr. Thomson suggested to me, but the substance in question is the stearopten of buchu oil, which was recently described by Prof. Flückiger as *dios-phenol.* One object, however, which I had in view could not be accomplished, namely, the examination of the buchu leaves in their natural state; unfortunately, the entire package had been ground and

used in the preparation of fluid extract, so that it was impossible to determine whether the leaves were all derived from one species. All the information that Mr. Thomson could give me on this point was that it was the short variety, probably *Barosma betulina*, and that the leaves were of a brighter green and fresher in appearance than buchu is usually found in the market.

That the crystallization of stearopten, under the circumstances mentioned above, has not been observed more frequently may be accounted for, probably, for one or two reasons, either the same species of Barosma, under the influence of soil and climate, or from difference in age, may contain variable quantities of volatile oil or of stearopten; or commercial buchu may sometimes be mixed with the leaves of a species which is naturally richer in volatile oil or in stearopten. As regards the former, it may be mentioned that, in 1863, Prof. Bedford obtained from short buchu between 1·02 and 1·60 per cent. of volatile oil. From Barosma betulina Flückiger and Hanbury obtained 1·56, and when operating on larger quantities, 1·63 per cent. ("Pharmacographia"); recently, however, Prof. Flückiger's yield from 35 kilos of round buchu was only 180 grams, or a little more than one-half per cent. ("Yearbook," 1880, p. 461). If the proportion of stearopten be the same in these cases (nearly $\frac{1}{3}$ the weight of the volatile oil, Flückiger), it will be observed that the quantity contained in some leaves is more than three times greater than in other leaves of the same commercial variety.

The leaves of Barosma serratifolia, or long buchu, yielded to Prof. Bedford between 0·62 and 0·71 per cent. of volatile oil. I am not acquainted with other determinations of volatile oil in buchu leaves of known botanical origin, or of known commercial variety.

Diosphenol is characterized by Flückiger (*loc. cit.*) as follows: Elementary analysis leads to the formula $C_{14}H_{22}O_3$. It crystallizes in colorless needles or somewhat larger prisms of the monosymmetric (monoclinic) system, melts at 83°C. (181·4°F.), boils at 233°C. (451·4°F.), sublimes in the heat of a steam-bath in thin prisms, but cannot be distilled without partial decomposition. It is readily soluble in alcohol of 0·83 sp. gr., less so in ether, but very sparingly in water; the solution in boiling water, on cooling, affords acicular crystals. The solutions are perfectly neutral, and on addition of an alcoholic solution of ferric chloride assume a dark coloration of dingy green. Diosphenol has a slightly aromatic odor and taste *sui generis*,

by no means like that of buchu leaves. It is soluble in concentrated sulphuric acid, but without forming a crystallizable compound. It is also readily soluble in caustic alkalies, and is precipitated from these solutions by carbonic acid. No well defined compound of diosphenol with potassium, sodium or barium could be obtained. Salicylic acid could not be obtained from oil of buchu.

At the time Prof. Wayne reported his results he kindly presented me with samples of the two crystalline substances obtained by him. One of these principles agrees in all its properties with the diosphenol of Flückiger; the other is without doubt salicylic acid, as is made evident by the purple reaction with ferric chloride, by its melting-point, which is above 150°C.=302°F. (salicylic acid melts at 155°C.=311° F.), and by the odor, which is similar to that of oil of wintergreen, given off on heating a little of the substance with alcohol and sulphuric acid.

Of the six samples of buchu oil in my possession one was distilled by myself from Barosma betulina, and all except one are at the present date over fifteen years old. Four of the oils have deposited stearopten either in large or small crystals, which in all cases agree in properties with diosphenol. The oil of long buchu, Barosma serratifolia, of which I have a specimen, distilled by Prof. Bedford, gives with ferric salt a greenish-black reaction, without the slightest tint of purple, and is therefore free from salicylic acid.

From the above, I believe it may be considered as proven that the leaves of Barosma betulina and of Bar. serratifolia do not contain salicylic acid, nor yield it on being subjected to distillation with water. Whether that compound may be produced from the leaves under the influence of fermentation has not been ascertained. It is not unlikely that the presence of another kind of leaves, whether of the genus Barosma or of some other genus or natural order, may account for the yield of salicylic acid, observed by Professor Wayne.

Gigantic Rhubarb.—According to the "Journal de St. Petersburg," Colonel Przewalsky, while making his way from Lining-fu to the sources of the Yellow river, passed through a plateau where a rhubarb plant grows wild and attains an extraordinary development. Roots were found which were 16 in. long, 12 in. broad and 7 in. thick and weighed 26 lbs.—*Phar. Jour. and Trans.*, April 16, p. 860.

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

Myroxylon peruiferum, Lin. F.—From this tree of tropical America a balsam, similar to balsam of Peru, and by a similar treatment, may be obtained, as was ascertained by Th. Peckolt. Its specific gravity at 17°C. was 1·031; its odor was pleasant, between that of benzoin and vanilla. When compared with true balsam of Peru, the balsam obtained from *M. peruiferum* exhibits the following differences:

M. Pereiræ.	*M. peruiferum.*
Taste warming to the tongue; then burning the throat; bitter and aromatic; odor agreeable, like vanilla.	Taste slightly pungent, but not warming; aromatic and astringent; odor aromatic.
Yields a volatile oil when distilled with water.	Gives only traces of a volatile oil.
Mixes with chloroform in all proportions.	Acts in the same manner, but deposits a powdery precipitate on standing.
Dissolves in six parts of 90 per cent. alcohol, and gives, after a time, a fawn-colored deposit.	Soluble in 90 per cent. alcohol in all proportions, and forms no deposit.
Ether, benzin and petroleum spirit dissolve only the yellow oil (cinnamein).	Insoluble in these three liquids.
Bisulphide of carbon only partially dissolves it, giving a yellow solution.	Bisulphide of carbon partially dissolves it, forming a clear light brown solution.
Castor oil takes up 15 per cent.	Mixes with castor oil in all proportions.
Equal volumes of balsam and concentrated sulphuric acid mixed give a stiff mixture which, kneaded with water, yields a brittle resin, which is not sticky when pressed between the fingers.	The same treatment causes the formation in twelve hours of a gelatinous mass of a reddish-black color which, kneaded with water, colors it dirty green; the mass, after washing, is sticky, and of greasy consistence.

In many points the balsam from the wood of *M. peruiferum* agrees with balsam of Peru, and the author thinks it could for many medicinal purposes replace that more expensive drug, and might be distinguished in commerce as Brazilian balsam. He states that he has used it with remarkable success as a balsam for wounds and in the treatment of scabies.[1]—*Phar. Jour. and Trans.*, April 2, 1881.

[1] The fact of its mixing readily with castor oil in all proportions would give it an advantage over the balsam of Peru for use in stimulating pomades.

Erythrina corallodendron, Lin., a medium sized spiny leguminous tree of tropical America, is employed in asthma and cutaneous diseases as a mild laxative, diuretic, etc.; the bark and leaves, also the flowers are used. In Brazil the tree is known as "mulungu." Rochefontaine ("Compt. Rend.," xciii, p. 733) obtained some reactions rendering the presence of an alkaloid probable, for which the inappropriate name erythrina is suggested; the aqueous extract employed hypodermically was found to decrease the functions of the central nervous system, and the bark seems to possess sedative properties.

Poisonous Staranise has been observed in various parts of Europe. It is derived from *Illicium religiosum*, Siebold, which by most botanists has been regarded as identical with *Ill. anisatum*, Lour. The latter is a native of the high mountains of Yunnan in southwestern China and to the west of Canton. The former was introduced into Japan from China or the Corea in ancient times by the Buddhist priests and planted around the Japanese temples, being used when in blossom for adorning the altars and tombs. In Japan it is known as *somo, skimi* or *fauna skimi* and in China as *ao-woo-soo*, while Ill. anisatum is *hwai hiang*. The fruit of Ill. religiosum, which is not used in Japan, is described by E. M. Holmes as being about one-third less in diameter than the Chinese drug; the number of carpels is 8 and a few only are generally developed to maturity. The curve or depression of the ventral suture near the apex is deeper and shorter, and hence the very short beak appears more erect than in the Chinese drug. Neither the pericarp nor seed has any taste of anise, but possesses a very faint taste and odor like the oil of *Laurus nobilis*, or distantly resembling the odor of cubebs. The seeds vary in thickness according to the degree of ripeness. The fruit when wetted and laid on a piece of blue paper reddens it immediately and strongly, while Chinese staranise causes only a very faint red coloration, and the fruits of I. Griffithii and I. majus produce no such reaction.

From Holmes' description of the fruits of other species, the following is extracted:

Ill. parviflorum, Mich., indigenous to Georgia and Carolina; carpels 8; short-beaked; taste resembles sassafras.

Ill. floridanum, Ellis, indigenous to the coast of Florida; carpels 13; taste like anise. In Alabama the leaves are reputed to be poisonous, and the plant has hence acquired the name of poison bay.

Ill. Griffithii, Hook fil. et Thoms., native of East Bengal; carpels

13; resemble in color staranise, but are darker at the ventral and dorsal sutures; on the sides with scars; beak short, incurved; terminal depression well marked; taste at first none, but shortly bitter, with some acridity, and a flavor between that of cubebs and bay leaves.

Ill. majus, Hook fil. et Thoms., native of the Thoung Gain range in Tenasserim, at an altitude of 5,500 feet; carpels 11 to 13; terminal depression longer and shallower and beak short and less incurved than in the preceding; taste strongly resembling mace, not bitter.—*Phar. Jour. and Trans.*, 1880, Dec. 18, pp. 489 to 491.

Thalictrum macrocarpum.—The root contains, according to Hanriot and Doassans, a neutral principle, *macrocarpin*, and an alkaloid, *thalictrina*. The alcoholic tincture is concentrated in a vacuum, then treated with ether and finally precipitated by water. Macrocarpin crystallizes in yellow needles, is insoluble in ether, but soluble in water, alcohol, and more so in amyl alcohol; it dissolves also in ammonia and is precipitated by acids. By exhausting crude macrocarpin with ether, thalictrina is obtained in colorless crystals, insoluble in water, and soluble in ether and alcohol. Its nitrate is crystalline and in its properties and reactions it resembles aconitina.—*Bull. Soc. Chim.*, 2d ser., xxiv, pp. 33, 34.

Lawsonia alba, Lam.—"Henna al henna," a cosmetic used by the Persians, Arabs and Egyptians, is a greenish-brown, tolerably uniform powder, feeling somewhat sandy between the fingers; by long exposure the surface acquires a reddish tint. It is a powder of Lawsonia leaves rendered somewhat impure by foraminiferous sand. Dr. H. Paschkis has examined three specimens of henna and two samples of Lawsonia leaves, one coming from Persia, the other from the French colony of Senegal; the latter are only distinguishable from the former by being 1 or 2 centimeters longer. The Persian leaves attain a length of 2 cm. and a greatest breadth of 1 cm.; they are ovate, acute, mucronate, short-petiolate, entire and slightly revolute at the margin, coriaceous, shining and greenish-brown on the upper surface, lighter beneath; the lateral nerves are anastomosing near the margin. In the epidermis of the upper side are irregularly distributed numerous large mucilage cells, and both the upper and lower surfaces contain numerous stomata. The mesophyll consists of a double palisade layer and of the cells containing chlorophyll, among the latter numerous rosettes of calcium oxalate.

Lawsonia leaves contain tannin, turning green with iron salts, and

yield with water a bitter extract, dissolving in ammonia with a beautiful Malaga-brown color. Alcohol now extracts wax, chlorophyll and resins, two of which are soluble in ether, one being soft and acrid, the other hard and in microscopic turmeric-yellow scales. Digested with potassa, a volatile alkaloid is given off, probably trimethylamina.

In Oriental countries, henna is used for ulcers and against all possible diseases. Its principal use is as a dye. Mixed with water, or perhaps with a little alkali, it is used for coloring orange-red the finger nails, the soles of the feet, the palms of the hands, also the points of the beard and the hair; for dyeing the hair black, the henna is used in combination with indigo.—*Zeitsch. Oest. Apoth. Ver.; Phar. Jour. and Trans.*, April 16, pp. 855–857.

Commercial Patchouli leaves have been examined by Dr. Henry Paschkis and compared with leaves of Pogostemon Patchouli from the Vienna Botanical Gardens. True patchouly leaves are from 6 to 10 centimeters (2 to 4 inches) long, ovate or rhombic ovate, narrowed at the entire base into a long petiole, above with an irregularly doubly crenate margin, light brown, moderately thin, not very abundantly hairy on both sides, with one principal nerve and the secondary nerves forming curves running towards the margin. The microscopic examination reveals in the epidermis of the upper and under side deeply indented, mostly elongated flat cells; among them, in greater number below and fewer above, are stomata with a single contiguous cell. The epidermal cells of the upper side are coarsely papillose, here and there brownish-colored. The hairs are simple throughout, several-celled (up to 6), with a warty cuticle, especially in the younger hairs On both sides of the leaf are numerous glands, the smaller ones being stalked, the larger ones stalkless and deeply imbedded in the epidermis.

The commercial leaves were found to be mixed with other leaves, of which the following are described:

1. Roundish, nearly transversely oval, 5-fid, dentate, 10 cm. broad, 8 cm. long, with radiate venation and cordate base; dark brown above, gray-green beneath; moderately hairy on both sides, more so on the under side; rather thin; in the mesophyll mucilage cells; on both sides small club-shaped cells; the hairs one-celled and clustered in bundles of 6 to 8.

2. Rhomboid, obtuse, coarsely dentate, 5 cm. long, 2·5 cm. broad, three-nerved, abundantly hairy on both sides, thick, brownish-gray.

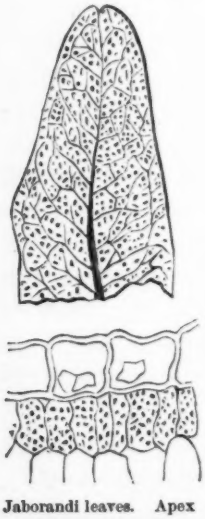
3. Five-nerved and five-lobed, sinuate, 7 cm. long, 5·5 cm. broad, the two lower lobes small and rounded, the next pair larger and with a shallow sinus at the margin, the terminal lobe largest; the base cordate; coarsely dentate; abundantly hairy on both sides; thick; brown above, green underneath.

4. Palmately five-nerved and sinuately five-lobed, each lobe again divided into two smaller lobes; all acute; coarsely dentate; obcordate at the base; about 10 cm. long and broad; brown above, gray-green beneath. In the microscopic structure, they agree with the preceding and differ but slightly from No. 1, mainly in the absence of mucilage cells.

Unmixed patchouli leaves appear to be rarely met with in the market; the sophistications amount in many cases to 80 per cent.; Nos. 2 and 3 were more frequently met with than the other two forms.

The author directs also attention to *Plectranthus Patchouli*, a labiate sold under the name of patchouly herb. The leaves are similar to true patchouli leaves, are 6 cm. long and 5 cm. broad, ovate, acute, doubly dentate and petiolate; on both sides with few stomata, with simple several-celled (up to 14) hairs and with numerous glands, the larger ones of which are imbedded in the epidermis.

The leaves of two malvaceæ, *Lavatera obia* and *Pavonia Weldenii*, are five-nerved, resemble some of the false patchouli leaves, the former containing mucilage cells.—*Zeits. Oest. Apoth. Ver.; Phar. Jour. and Trans.*, April 2, pp. 813–815.

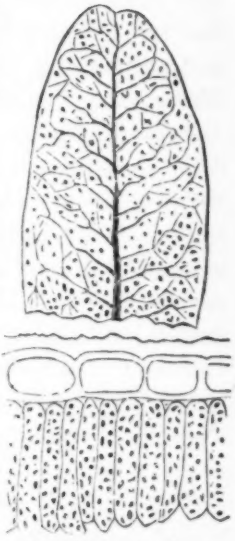


Jaborandi leaves. Apex and transverse section.

False Jaborandi.—Dr. A. Tschirch has received from Gehe & Co. leaves which bear a considerable resemblance to the leaves of Pilocarpus pennatus, and which are probably also derived from a rutacea. The shape and size of the leaflets of rutaceæ vary considerably; in commercial jaborandi, variations from lanceolate to oval may be observed, differing in size from 6 to 15 cm. The venation is very distinct and, anastomosing near the margins, separates the inner part of the blade quite plainly from a narrow marginal zone. In the false jaborandi the final divisions of the fibro-vascular bundles are less distinct, and their anastomosing lines near the margin less clear.

The anatomical structure furnishes further differences. The upper epidermal tissue of both

leaves consists of one row of cells, which in the true jaborandi are larger, have thin walls, and are usually filled with a brown mass, insoluble even in boiling alcohol. The epidermal cells of the false jaborandi have the inner walls relatively much thicker and occasionally contain a granular, but never a brown mass, hence these leaves are always of a brighter green. The palisade tissue under the upper epidermis is in the true jaborandi of about the height of the epidermal cells, but in the false jaborandi it is mostly twice as high. The fibrovascular bundles in the midrib of the true jaborandi have almost always a nearly continuous circle of bast cells, while the false jaborandi has usually merely a few scattered groups of bast cells on the line of the cambium circle.—*Phar. Zeitung*, May 21, p. 305.



False Jaborandi. Apex and transverse section.

Angræcum fragrans, P. Th.—Dr. H. Paschkis describes the faham leaves or Bourbon tea of French commerce as consisting of well-preserved entire leaves and leafy stalks. When fresh they have an agreeable but not very strong smell, remotely resembling that of coumarin. They are yellow or yellowish-brown; softening like leather in water; very tough; attain a length of over 7 centimeters and a breadth of more than 1 cm.; are linear, rounded and emarginate at the apex, attenuate and sheathing at the base, and have the parallel veins more prominent on the under side. The epidermis of the upper surface is free from stomata and consists of regular long hexagonal cells, which contain either minute light-refracting granules, brilliant drops or scales, or delicate needles, scales and tables, which latter are soluble in alcohol and ether and run together in potassa solution to drops, refracting light strongly. The lower surface contains numerous stomata margined by swelled thickened guard cells, and consists of more elongated epidermal cells and bears in depressions brown stalked glandules. The cuticle is thick yellowish-brown. The sub-epidermal layer consists of thickened cells with narrow lumens, larger on the upper side, smaller and nearly circular on the lower side. The mesophyll is a wide-meshed tissue, the cells being elongated above and quadratic below, some larger elongated ones containing raphides. The prosenchyma of the vascular bundles consists of netted porous

cells, smaller scalariform and larger spiral vessels and of numerous bast like fibres, and is accompanied by fibre-like series of cells, apparently containing silica.—*Zeitsch. Oest. Apoth. Ver.; Phar. Jour. and Trans.*, May 7, p. 913.

Stigmata Maydis.—By treatment with hot water, H. Vassal obtained from the stigmas of maize, a reddish-brown extract, which in odor and taste resembled extract of ergot, except that it was rather more bitter. It is free from gummy and albuminous compounds, yields in aqueous solution a black precipitate with ferric chloride, and does not contain an alkaloid. Alcohol of 63 per cent. dissolves most of the extract, and the solution on evaporation yields a granular residue, having an animal odor, a bitter taste and an appearance resembling ergotin; on incineration it leaves considerable ash, containing a large amount of sodium carbonate. The extract is insoluble in ether and spirit of ether.

The alcoholic tincture of maize stigmas, on evaporation, yields a turbid liquid from which ether separates a yellowish, tasteless, saponifiable, oily matter; the aqueous liquid, on evaporation, yields a reddish-brown extract of the same characters as the first product.

Ether dissolves from the stigmas only a fatty matter having no characteristic odor and taste.

It follows from the above that, for pharmaceutical purposes, maize stigmas are best exhausted with water.—*Jour. Phar. d'Anvers.*, May 15, pp. 153–155.

The Wax Palm, Copernicia cerifera, known also as Carnauba palm, is very abundant in Pernambuco. The wood is used for roofing, both as beams or rafters and as laths upon which to support the tiles; the fruits are used for feeding cattle and the leaves for making hats and mats. A valuable medicine is obtained from the roots. From the shoots and leaves a wax is obtained; for this purpose they are cut before they unfold, dried in the sun, powdered and boiled, the wax rising to the surface of the water. The exportatiom of Carnauba wax amounted in

1875–76 to	18,668	kilos,	valued at	£ 758.
1876–77 to	171,980	"	"	" 6,957.
1877–78 to	89,482	"	"	" 3,168.
1878–79 to	1,542	"	"	" 61.

The decrease during the last year was due to the famine and drought which so severely crippled all industry in the province. The seeds

of the Carnauba palm are used in Pernambuco as coffee.—*Scientific American*, May 21, p. 329.

Testing of Olive Oil.—In a paper read before the Liverpool Chemists' Association, Michael Conroy recommends the following: Mix thoroughly 1 part of nitric acid, sp. gr. 1·42, with 9 parts of the oil, pour into a large white porcelain dish, heat gently until the action is fairly set up, remove the source of heat and stir with a glass rod until the action is over. Pure olive oil, thus treated and allowed to cool, sets into a pale straw-colored hard mass in an hour or two, while cotton-seed and other seed oils assume a deep orange color and do not set like olive oil. An admixture of 5 per cent. of any seed oil with olive oil can be readily detected, and the contrast in color is such that the approximate amount of the admixture may be accurately ascertained.—*Phar. Jour. and Trans.*, 1881, May 14, p. 933.

THE COTTON-SEED OIL INDUSTRY.

From a lengthy report in the "Oil and Drug News" of May 17, we make the following abstracts:

The first attempt to extract oil from cotton-seed was made at Natchez in 1834, but it failed. In 1852, it was tried in New Orleans, and again failed. Another attempt, in 1855, by Messrs. Paulin Martin, F. M. Fisk, Paul Aldige and A. A. Maginnis was crowned with success. In 1867, just after the war, there were seven mills in the country; in 1870, twenty-six, and in 1880, forty-seven—six of them in New Orleans—which in that year employed 1,525 hands, paid out $374,142 in wages and produced $2,742,000. At present there are 43 cotton-seed oil mills in operation in the South, each of which is capable of crushing two-thirds of a ton of seed a day. Several other mills are in course of construction.

When well stored and properly ventilated, cotton-seed keeps sweet for twelve months; if allowed to become damp or stored too long in bulk, it grows heated and is liable to spontaneous combustion.

The total amount of cotton-seed crushed in the United Ststes is about 410,000 tons, or 10 per cent. of the annual crop, of which the New Orleans mills last year, 1879–80, consumed 107,000 tons.

The seed, when landed at the mill, is freed from dust by shaking it in a screen or cylindrical sifter, and is afterwards blown against a screen, thus allowing heavy substances to fall from it. It is then freed from

the cotton adhering to it by means of gins and cut up fine in a revolving cylinder containing 24 cylindrical knives and 4 back knives, and the kernels are separated from the hulls, which make very good food for cattle, selling at $7 a ton. The seed is now pressed between rollers like those of a sugar mill, the oil running freely from it; put in woolen bags and placed between horse-hair mats, backed with leather having a fluted surface inside to facilitate the escape of the oil under the hydraulic pressure amounting to 169 tons. The bags remain in the press 17 minutes, the solid "oil cake" of commerce remaining behind. The crude oil is pumped into the oil room and either barreled for shipment or it is refined by treatment with from 7 to 15 per cent. of caustic soda, the oil being stirred at the same time by means of paddles, or by means of air forced through holes of a long iron pipe contained in the kettle. A dark brown substance known as "soap-stock" is deposited and the refined oil, amounting to about 82 per cent. of the crude oil, is drawn off into large tanks where it is kept stored until ready for barreling and shipping. The soap-stock is warmed so as to separate what oil remains in it, and is then sold at $1\frac{1}{8}$ cent a pound, or used by the mill itself in the manufacture of soap; sometimes dyes are made from it.

The average yield of a ton of seed is

35 gallons of crude oil at 30 cents per gallon,	$10 50
22 lbs. of cotton at 8 cents,	1 76
750 lbs. of cake at $20 per ton,	7 20
Total yield for a ton of cotton-seed,	$19 46

About 410,000 tons of seed reach the mills annually, producing, for the entire South, $7,772,140—about 3 per cent. of the value of the cotton crop.

The *cotton-seed cake* is of a rich golden color, quite dry, and has a sweet, nutty, oleaginous taste. It is shipped in sacks containing 200 lbs. each, its principal uses being for stock feeding and fertilizing purposes. When ground to the fineness of corn meal it is known as "cotton-seed meal." Most of it is shipped to Great Britain, where it is extensively employed in fattening stock, it yielding a larger proportion of meat to the pound than any other animal food. It is also a good milk producer.

The *oil* is used in the manufacture of soap, by painters and for lubricating purposes; its great use, however, is as a substitute or adulterant for olive oil, whose place it is rapidly supplying, and from

which it is difficult to detect by taste and smell. By mixing 75 parts of cotton-seed oil with 25 parts of olive oil, a fine table oil is produced, but often the former receives only a small amount of some other oil to give it a flavor. Of 140,840 barrels, or nearly 6,000,000 gallons, shipped from New Orleans during last season, 88 per cent. was exported on orders from Europe to Mediterranean and French ports, and one-half of this to Italy. This is more than the entire olive oil production of France and one-fifth that of Italy itself.[1] The United States imports only one-tenth this amount of olive oil, so called.[2] Some oil also goes West, where it probably figures as olive oil without the intervention of a voyage across the Atlantic; but at least two-thirds of the entire product of the country (15,000,000 gallons) is exported to Europe. It is thought that, in time, the prejudice now existing against cotton-seed oil will be overcome and our people, like those of Europe, take to cooking their food in oil, as the Hebrews do, instead of using lard.

By the use of close saws, the oil factories are able to obtain what little *lint* is left adhering to the seed, amounting to about 5 per cent. of the cotton, or 22 lbs. to a ton. The lint is short in staple, but exceedingly white and clean, and the better grades command 8 cents in the market. It is too good for paper-stock and is generally used in the manufacture of cotton batting. The cotton "crop" of the mills last year amounted to over 5,000 bales.

The *hulls* constitute about one-half of the seed, or 1,000 lbs. to the ton. They are employed as fuel for running the mill; some oil being still left in them, they burn well and furnish all the fuel necessary, the mills finding it unnecessary to purchase a bushel of coal. The ashes yield a cheap and valuable fertilizer and, when leached, furnish a good lye used in the manufacture of soap. Mr. Atkinson, of Boston, is of the opinion that the hulls will furnish a good stock for the manufacture of paper, and suffice to supply all the material needed by the paper manufacturers of this country.

There is a large profit in the manufacture of cotton-seed oil in prosperous seasons, some companies paying as large annual dividends

[1] The average annual production of olive oil in Italy is estimated at 1,500,000 hectoliters or 33,000,000 gallons ("Pharmacographia," p. 376); more recently at 3,000,000 hectoliters (*loc. cit.*, 2d edit., p. 420); that of France at 250,000, and by Coutance at 400,000 hectoliters.

[2] In 1879-80, 124,518 gals. of olive oil and 239,507 gals. salad oil were imported at New York. D. C. Robbins, "Review of Drug Trade," p. 11.

as 40 per cent. The chief hindrances to the business are: *bad seeds*, which it is almost impossible to detect; *danger from fire*, the mills being thoroughly saturated with oil, and *prejudice of the farmers*, the selling of cotton-seed being regarded as impoverishing the land by withdrawing an important fertilizer from it. Last year the New Orleans mills paid out about $360,000 for freight alone. The sacks cost the companies $100,000 a year.

The region tributary to New Orleams raises each season nearly a million tons of seed. If but half of this be consumed by the oil mills, allowing the other half for planting, wastage, etc., this will leave enough to give employment to 8,000 hands and to turn out $12,000,000 of products, to produce 25,000 bales of cotton now wholly lost and 35,000,000 gallons of fine vegetable oil. The very refuse, 180,000 tons of cake, will supply the region tributary to New Orleans with all the meat it wants, and the soap-stock left behind with an ample supply of soap.

In Italy the duty on cotton-seed oil, pure or mixed with other oils, has been increased from 6 to 20 lires per quintal, and a tax of 14 lires per quintal has been fixed on cotton-seed oil made in Italy, according to Vice Consul-General Hooker, of Rome. This action was deemed necessary in view of the heavy adulteration of olive oil with cotton-seed oil for table use, which was injuring the home production and discrediting it on foreign markets. During the five years, 1875 to 1879, there were imported from the United States and Canada 140,000 quintals, the imports increasing to 213,754 quintals during the year 1880.

Mr. J. B. Gould, the U. S. Consul at Marseilles, reports that in the neighborhood of that city, and especially at Avignon, cotton-seed oil mixed with palm, cocoa and other nut oils, is chiefly used for an inferior quality of soap known as *savon blanc à froid*; that used in soap factories chiefly comes from England, and more particularly from the crushing works at Hull. American cotton-seed oils are now granted great favor, because they are entirely tasteless, but they congeal at a higher temperature than pure olive oil. However, samples of American oil have been received which keep their fluidity as low as —5°C. This improvement is not likely to be taken into much account at Marseilles, as the price of such oils is naturally higher than that of the simply purified oil, but it is expected to give an opening to American cotton-seed oil in the North, where the higher

congealing point had heretofore proved an insuperable objection to its use.

The official statements show that most of the cotton-seed oil imported at Marseilles is re-exported under its proper name, either by land or by sea, which would indicate that the practice of mixing cotton-seed oil with olive oil is not in great favor at Marseilles, but the Marseilles olive oil, being first imported from Italy or the interior of France, may have been tampered with at the places of production. A large proportion of the cotton-seed oil is used by a portion of the population in its pure state and with the full knowledge of the consumer, who may, especially in the districts where the olive tree is not grown, prefer to make use of what he knows to be pure cotton-seed oil, and which he may obtain at lower rates than inferior olive oil, upon the genuineness of which he cannot rely.

The importation of cotton-seed oil at Marseilles has increased from 34,508 barrels, or 6,700,735 kilos in 1879, to 53,462 barrels, or 9,841,073 kilos in 1880. Less than half of this amount was imported from England, but a large proportion of this was probably shipped from the United States and transshipped at some English port.

COMMERCIAL VANILLA.

Origin.—J. Ch. Sawer reviews the opinions expressed by different botanists as to the origin of commercial vanilla, which seems to be derived from several varieties of perhaps several species, and inclines to Morren's views ("Bull. Acad. Roy. Belg.," 1 ser., xvii, p. 130), that the question can only be solved by an experienced naturalist who should examine the plants in the localities where they actually grow, compare the different length, thickness, shape, color, flavor and value of the fruit yielded by each species and variety, and accompany the diagnoses made by drawings on the spot. The finest commercial vanilla is found by Morren to closely resemble the fruit of *Vanilla planifolia*, Andrews.

Cultivation.—From Jaillet's report to the Société d'Emulation ("Rép. Phar.," 1880, p. 357) we quote the following condensed account of the cultivation and preparation of vanilla.

In Mexico vanilla plantations are established in forests by cutting down all shrubs, climbers and large trees as would give an excess of shade, leaving only young trees, preferably those containing a milky

sap, to serve as supports to the plants. Close to each tree two cuttings are planted side by side in a shallow trench about 1½ inch deep and 15 or 20 inches long, three joints of the cuttings, after the removal of the leaves, being covered up with dried leaves, leaf mould, coarse sand, brush wood, etc., and the remainder of the shoot, 3 or four feet long, tied to the tree. The bed should be slightly raised above the level of the soil, and the supporting trees should be quite 12 to 15 feet apart. The cuttings will have taken root after a month, must be kept free from weeds and underwood, and will commence to bear fruit in the third year. For establishing vanilla plantations in a field, the land is thoroughly ploughed, and sowed with maize; and, while this is growing, young lactescent trees of the fig tribe make their appearance, and after a year are large enough for supporting the vanilla plants, from which the finest product is obtained. The fecundation of the flower is left to nature, and the plant is allowed to climb up over the trees.

In the Island of Réunion (Bourbon) the fecundation is performed artificially, and the plant is not allowed to grow out of the reach of the cultivator, but is guided along trelises formed by sticks, connecting the trunks of the trees together transversely. For supports of the vanilla in plantations established in the open field, mangoes, fig trees, or preferably physic nut trees (Jatropha curcas), are first grown, and the cuttings are set in trenches 8 inches deep, dug between the trees and near the trelises.

Fecundation.—As the labellum totally covers the stigma, and the anther rests on the labellum, spontaneous fecundation is comparatively rare, and even in Mexico and other countries, where the plant is left to itself, it has been observed that a length of 12 to 26 inches of vine will produce only one pod from about 40 flowers, all of which can be artificially fecundated. This was formerly performed by cutting the labellum, but is now more successfully done by the method of a creole slave in the colony, by slipping away the labellum from beneath the anther, and thus bringing that organ in direct contact with the stigma. To prevent injury to the plant by excessive fecundation, only 5 or 6 of the finest flowers on each bunch having a large fleshy peduncle, are fecundated, and when this is assured from the persistence of the flowers and their drying at the extremity of the fruit, the remainder of the bunch with all its buds should be cut off.

The handsomest fruits are obtained from the first flowers, but the best from the last flowers which open on each bunch.

Harvesting.—The fecundated flowers decay at the extremity of the ovary, leaving the persistent gynostem attached to the fruit, which continues to grow for a month, but must be left on the stem for six months longer to allow it to ripen. Each pod should be cut off separately as it matures. The only certain indication of maturity is the crackling produced on pinching the pod between the fingers; the apple-green or greenish-yellow color is not a sufficient sign. If unripe the product will lack fragrance, color, etc.; if over-ripe, it is apt to become split in curing.

Curing of the Fruit.—The odor of vanilla does not pre-exist in the ripe fruit, but is developed by a process of fermentation. If allowed to remain on the plant, the pod splits into two unequal parts, becoming yellow, brown, and finally black. While it is drying it exudes an unctuous liquid, of a dark red color, called *balsam of vanilla*, and when quite dry becomes brittle and devoid of perfume.

The curing is effected in Guiana by placing the pods in ashes until they begin to shrivel, when they are wiped, rubbed over with olive oil and, their lower end having been tied, are hung in the open air to dry.

In Peru the pods are dipped into boiling water, tied at the end and hung in the open air for 20 days to dry; they are then lightly smeared over with oil of palma christi, and a few days later are tied in bundles.

In Mexico the pods are placed in heaps under a shed, protected from sun and rain, and in a few days, when they begin to shrivel, are submitted to the sweating process. If the weather happens to be warm and fine, the pods are spread out in the early morning on a woolen blanket, and exposed to the direct rays of the sun, but about mid-day are wrapped in the blanket. In the evening they are enclosed in air-tight boxes for sweating during the night, and on the next day they are again exposed to the sun, the dark coffee color which they acquire being deeper in proportion to the success of the sweating operation. In cloudy weather the vanilla is made into bundles; a number of these are packed together into a small bale, which is first wrapped in a woolen cloth, then in a coating of banana leaves, and the whole, enclosed in a mat, is firmly bound and sprinkled with water. The bales containing the largest beans are now placed in an oven heated to

140°F. When the temperature of the oven has fallen to 113°F., the smaller beans are introduced and the oven is closed tightly. Twenty-four hours afterwards the smaller beans were taken out, and twelve hours later the larger ones. During the sweating the vanilla acquires a fine chestnut color. It is now spread on matting, exposed to the sun every day for about two months, and when the drying is nearly complete is spread out in a dry place, and finally tied up in small packets.

In Réunion the pods are sorted according to length and scalded in water of 194°F., the long ones for 10 seconds, and the medium and short ones for 15 seconds and one minute. They are then exposed for 6 or 8 days to the sun, between woolen blankets, until they acquire the characteristic chestnut color, when they are spread out, under sheds roofed with zinc, to dry gradually for about a month, being frequently turned in the meantime. When they have acquired the proper degree of dryness to be easily twisted around the finger without cracking, they undergo the *smoothing* process, each bean being repeatedly passed by the operator between his fingers; the oil exuded from the entire surface of the bean imparts the lustre and suppleness. When sufficiently dry, the beans are tied up in bundles of uniform length. The three commercial varieties are, 1, *fine vanilla*, 8 to 11 inches long, nearly black, unctuous, glossy and clean looking, and soon becoming covered with frost-like crystals; 2, *woody vanilla*, 6 to 8 inches long, lighter in color, more or less spotted with grey, not glossy, with few crystals; collected in an unripe condition; 3, *vanillons*, either obtained from short ripe fruit, frosting well, or the abortive and unripe fruit, whose perfume is simply the result of absorption from the fine beans with which they have so long been in contact.

The total yield of the Mauritius and Réunion plantations is estimated at 29,255 kilos in 1875, 34,322 kilos in 1876, 41,270 kilos in 1877, 35,000 kilos in 1878 and 40,000 kilos in 1880.

Vanillin.—Its amount in commercial vanilla from various sources has been estimated at from 1½ to 2½ per cent. The benzoic acid found by some chemists in Mexican vanilla was, according to Tiemann and Haarmann, a mixture of vanillic acid and its aldehyd vanillin; or benzoic acid may have been dusted over inferior qualities of vanilla to imitate the natural inflorescence. Although vanillin is the principal vehicle of the aroma, it is believed not to constitute the sole flavor and perfume of vanilla, and that the vanillin prepared artificially by

Tiemann and Haarmann will not quite discourage the Mexican and Bourbon planters.

Vanillon.—The odor of East Indian vanillon more resembles heliotrope, probably owing to a trace of benzoic aldehyd. Tiemann and Haarmann found the vanillin to amount only to 0·4 per cent., and to be more difficult to isolate by reason of the presence of a minute quantity of oily matter, which adheres to it with great tenacity.

Products having a Vanilla-like Odor.—The "wild vanilla" of North America is *Liatris odoratissima*, Willd.; the odor of the leaves resembles that of vanilla and tonka. For description, use, etc., see "Amer. Jour. Phar.," 1859, p. 566; 1866, p. 443; 1874, p. 299, and 1875, p. 116.

The dried leaves and fruit of *Angræcum* (s. *Aerobion*, Sprengel; *Aeranthus*, Reichenbach) *fragrans*, Du Petit-Thouars, which is known in Réunion and Mauritius as "faham," and in Madagascar as "fanave," possess an agreeable odor, resembling a mixture of vanilla, tonka and melilot. The aromatic principle of the leaves is soluble in alcohol, ether and boiling water; it has been isolated by Gobley ("Jour. de Phar.," xvii, p. 350) in the form of small white silky needles, which, on being pressed between the fingers or slightly warmed, develop the characteristic odor of "faham" and bitter almonds. It was found to contain C 76·12, H 4·12 and O 19·76, approximating it to the composition of coumarin. The fruit is supposed to contain a larger proportion of this principle than the leaves. The plant is propagated by seed. An infusion of the leaves is taken as a beverage; the mucilaginous and bitter properties contained in them are considered to act as a digestive and as a remedy for pulmonary consumption, and the dried leaves when smoked as beneficial in cases of asthma (see also this Journal, page 339). A somewhat similar odoriferous principle has been found in the leaves of other orchideous plants, as the *Orchis fusca*, and the *Ophris antropophora*, but not identical with vanillin.—*Pharm. Jour. and Trans.*, March 18, 1881, pp. 773–775.

Reddened Carbolic Acid.—H. W. Langbeck attributes the reddening of carbolic acid to the formation of rosolic acid; its solution in water containing carbonic acid gas is bleached like that of rosolic acid.—*Phar. Zig.*, No. 35, p. 260.

NERIUM ODORUM, Aiton.

By Henry G. Greenish.

The sweet-scented oleander is much cultivated in India for its flowers, which are used in certain religious ceremonies by the Hindus. All parts of the plant, especially the root, are recognized by the natives as poisonous; yet it is prescribed in leprosy and other diseases. The root has a grayish wrinkled bark, which is internally yellowish-green and covers a soft yellowish-gray wood. The bark is composed of about 10 rows of cork cells, followed by parenchymatous tissue, which is traversed longitudinally by numerous laticiferous vessels and is free from bast fibres. On treating sections with iodine and zinc chloride, the parenchymatous cells are colored blue and the dried latex absorbs iodine, assuming a yellow color. The wood consists of the usual elements, wood-cells and vessels, which are thin walled and of small diameter, and medullary rays composed of a single row of parenchymatous cells loaded with starch grains. A sample of bark examined was found to be internally and externally of a gray-brown color, bearing some resemblance to mezereon bark, from which, however, its short fracture at once distinguished it; the parenchyma contained small starch grains and crystals of calcium oxalate, also numerous groups of bast fibres arranged in a ring around the wood.

The alcoholic tincture of the bark, on being evaporated, separated a yellowish oil free from bitterness; the residue was diluted with water, mixed with powdered bole, filtered and again evaporated to a small bulk. This liquid was treated with petroleum spirit to remove fat, and then shaken with chloroform, whereby an oily substance was separated, which was removed, dried, powdered, washed with chloroform and ether, and now possessed an intensely bitter taste; this principle is called *neriodoreïn*. The chloroformic solution on evaporation yielded another intensely bitter principle called *neriodorin*. The aqueous liquid still possessed a bitter taste, due to the presence of some neriodoreïn.

Neriodoreïn is a pale lemon-yellow amorphous powder, of an intensely bitter taste, followed by a numbing sensation lasting a considerable time. It is insoluble in petroleum spirit, ether, benzol, chloroform, carbon bisulphide, amyl-alcohol and acetic ether, but is easily soluble in cold water and in alcohol; if contaminated with small quantities of neriodorin, it becomes extremely hygroscopic.

Dry neriodoreïn yields with pure sulphuric acid a reddish-brown color, at the edges violet, passing gradually to a dirty yellowish-brown and green; with sulphuric acid and cane sugar at first the same color, turning violet-blue; with nitric acid added to the sulphuric acid solution yellow, and with Froehde's reagent a deep dirty violet color.

A one per cent. solution in water is neutral to test paper, is tinged slightly brown by ferric chloride, and is not precipitated by basic lead acetate until a drop of ammonia is added, when a voluminous gelatinous precipitate is produced. With potassio-mercuric iodide, cupric acetate and neutral lead acetate, no change is observed. Tannic acid yields a yellowish precipitate. Fehling's copper solution is reduced on boiling. When boiled with dilute hydrochloric acid, a yellowish not bitter liquid is obtained, which reduces Fehling's solution and probably contains sugar; the insoluble decomposition product is separated by absolute alcohol into a yellow amorphous substance, soluble also in chloroform and boiling water, and into colorless needles, insoluble in alcohol, ether, water and alkalies, but soluble in chloroform; neither of these substances reduce Fehling's copper solution. On evaporating an aqueous solution of neriodoreïn with milk of lime, its bitter taste is lost and no appreciable quantity of it is taken up by absolute alcohol.

Neriodorin is a clear yellow, transparent, tenacious varnish-like mass, not pulverizable, easily soluble in chloroform, very difficultly soluble in cold water, but imparting to it its bitter taste, insoluble in petroleum spirit, benzol and carbon bisulphide, very slightly soluble in ether, and rather readily soluble in alcohol. Its behavior to reagents is very similar to that of the preceding principle, except that a cold saturated aqueous solution is colored deep reddish-brown by ferric chloride, the color being discharged by acids and alkali; and yields, with basic lead acetate, gelatinous flocks, and with potassio-mercuric iodide a copious whitish precipitate.

From the *wood*, very little neriodoreïn and a somewhat darker colored neriodorin were obtained.

Both principles are free from nitrogen and are powerful cardiac poisons. 0·0016 gram of neriodoreïn injected hypodermically into a large frog caused, in 14 minutes, diminution of the heart beats from 70 to 12, with a temporary rise to 60; in 5 minutes more, the heart ceased to beat, and this was closely followed by cessation of the respiration. A dose of 0·0032 gram produced death in 1½ hour. Quan-

titative experiments with neriodorin were not undertaken, owing to the difficulty of obtaining a solution suitable for hypodermic injection. Tetanic symptoms were not noticed.—*Phar. Jour. and Trans.*, April 23, pp. 873–875.

THE ALKALOID FROM PITURIE.

By Professor Liversidge, Assoc. R. S. Mines, F.I.C.

Abstract of a paper read before the Royal Society of N. S. W., Nov. 3, 1880.

The supply of piturie upon which this investigation was conducted was obtained with considerable difficulty. The blacks prize it very highly, so that it can only be obtained from them in very small quantities at a time; hence it involves the expenditure of much time and trouble to collect together a few pounds weight of the substance. It was obtained from the Diamantina blacks who trade yearly with the Mulligan or Kykockodilla tribe, in whose country the piturie grows.

The first parcel of piturie was in the form of broken twigs, and fragments of leaves of a pale brown color, emitting a smell somewhat similar to tobacco; the fine dust causes sneezing. This is its usual state, but a second parcel was much less broken up and was of a darker color, the difference being probably due to the less careful drying which it had undergone.

The author was informed that the blacks mix the piturie with the ashes of the leaves of a particular plant, and usually roll the mixture up with a green leaf into the form of a quid before chewing; the addition of the wood ashes is doubtless made for the same reason that lime is mixed with betel by the Malays and others, namely, for the purpose of slowly liberating the alkaloid during the process of mastication. The quid or bolus is, on ceremonial occasions, said to be passed from native to native, each one masticating it for a time, and then passing it on, it finding a resting-place behind the original proprietor's ear until again required.

The effects of the piturie seem from all accounts to be very much the same as those set up by tobacco-smoking; it does not appear to have the exciting effect upon the blacks with which it was at one time credited. As is the case with other luxuries, it is reserved by the older men for their own use exclusively, neither women nor young men being allowed to use it. The reasons for using it appear to be much

the same as those which induce white people to smoke and in certain cases chew tobacco.

In a letteer addressed to the author, Baron von Mueller gives the following account of the alkaloid obtained by him from piturie:

"For the preparation of piturina and pituric acid the branchlets and and leaves of *Duboisia Hopwoodii*, F. v. M., were subjected to exhaustion by boiling water, the infusion evaporated to honey thickness, then mixed with three volumes of alcohol, the resulting solution evaporated to the consistence of an extract, the latter disssolved in water and precipitated by basic acetate of lead. The precipitate, separated by filtration, contained a peculiar acid substance, while the filtrate, after sufficient concentration, and after mixing with an excess of caustic soda solution and ether, yielded to the latter the alkaloid which was purified by agitating its etherous solution with diluted sulphuric acid, thereby forming the sulphate of piturina. The aqueous solution of the latter was then again decomposed by caustic soda, the pure alkaloid removed by ether, and the solution evaporated at a gentle heat. It formed a brownish liquid of oil-like thickness, heavier than water, of acrid and burning taste aud tobacco odor, much affecting the organs of sight and respiration. It is volatile and forms fogs with diluted hydrochloric acid, is of strong alkaline reaction, and combines thoroughly with acids.

"Its hydrochloride forms precipitates with the chlorides of platinum and gold, with picric and tannic acids, phosphomolybdate of soda, bi-iodide of potassium, the iodide of potassio-mercury and potassio-bismuth, also with phospho-wolframate of soda, but this precipitate is easily dissolved in an excess of this reagent. Piturina mixes with every proportion of water, alcohol and ether. Concentrated hydrochloric and nitric acids do not effect a coloration with it; concentrated sulphuric acid forms reddish-brown clouds and dissolves to a brownish-green liquid. The yield was about 1 per cent. of alkaloid from the dried plant.

"Piturina is in some respects allied to nicotina, but more closely akin to the duboisina of *Duboisia myoporoides* (R. Br.), the latter being of lighter color, of bitter not acrid taste, of fainter odor, less irritating to the eyes and respiratory passages; its hydrochloride in solution is not precipitated by chloride of platinum, but is so by phosphowolframate of soda, and the precipitate is not redissolved by a superabundance of that reagent."

A. Ladenburg ("Comptes Rendus," 1880, vol. xc, p. 874–876), however, states that the alkaloid of *Duboisia myoporoides* is identical with hyoscyamia, and that it crystallizes in small needles, fusing at 108·5°C., and is isomeric with atropia, from which it is distinguished by forming a brilliantly lustrous compound with gold chloride, fusing at 152°C. Also when treated with baryta it is converted into *tropia* and *tropic* acid, both of which are also obtained from atropia.

The great discrepancy between A. Ladenburg's account and that of Baron von Mueller's the author thinks can only be accounted for by the supposition that Ladenburg must have been supplied with a different material. Baron von Mueller and Rummel ("Jour. Chem. Soc.," January, 1879) state very plainly that the *Duboisia myoporoides* yields a volatile oily alkaloid. In the same paper Baron von Mueller also describes piturie or duboisic acid obtained from the precipitate given by the piturie on the addition of basic acetate of lead.

In the "Pharmaceutical Society's Journal" for April 5, 1879, there is an account of an examination of some piturie made by Mons. Petit, of Paris, in which he comes to the conclusion that the alkaloid is identical with nicotina; but M. Petit does not seem to have had sufficient material to permit a combustion to be made of the alkaloid; he had to rely mainly upon its reactions with certain chemicals, and apparently was only able to make one determination each of the platinum and chlorine in the platinum salt; the amounts of which apparently roughly correspond with those required for the chloroplatinate of nicotina, viz., 34·4 per cent. platinum and 37 per cent. chlorine, the percentages obtained being platinum 34 per cent. and chlorine 36 per cent. These results, however, cannot be regarded as final, since, as will be shown later on, the platinum salt cannot be depended upon, as it is not of uniform composition.

In the preparation of the alkaloid by the author the piturie was extracted with boiling water slightly acidified with sulphuric acid, the liquid concentrated by evaporation and distilled with an excess of caustic soda, the alkaline distillate neutralized by hydrochloric acid, and evaporated over a water-bath until reduced to a small bulk; the yellowish residue was once more distilled with caustic soda, the distillate neutralized with hydrochloric acid and again concentrated. It was now nearly colorless; caustic soda was again added, and the liquid shaken up with ether. The ether was next removed by distillation, at as low a temperature as possible, in a current of hydro-

gen, the heat meanwhile being raised gradually until it reached 140°C., a bath of sulphuric acid being used for this purpose. It was allowed remain at this temperature for about six hours; the bath was then removed, and the distillation continued at a still higher temperature over a naked flame, the current of hydrogen being still maintained, until all the alkaloid, with the exception of a very small quantity, which had become charred, had passed over in a clear and colorless condition. During the distillation the thermometer indicated a temperature between 243° and 244°C.

Sixty grams of the substance gave ·622 gram of the alkaloid, or 1·037 per cent. In this case the alkaloid was not allowed to boil, but was maintained at a temperature of 140°C. in a current of hydrogen for several hours, to remove water and traces of ammonia. In a second experiment 500 grams of the piturie gave 12·34 grams of alkaloid, or 2·47 per cent., when distilled in a current of hydrogen. The piturie did not contain any non-volatile alkaloid.

The alkaloid when freshly prepared is clear and colorless, but with access of air rapidly becomes yellow, and finally brown, especially when exposed to the sunlight. In a sealed tube one specimen remained unchanged during eight months. It is soluble, in all proportions, in water, alcohol and ether, yielding colorless solutions. On paper it produces a greasy stain, which disappears after a time. It is just a little heavier than water, a drop of it sinking slowly to the bottom of a vessel of distilled water. When freshly prepared its smell is very like that of nicotina; afterwards, when darkened in color and thickened in consistency, the odor is more like that of pyridina. It is volatile at ordinary temperatures, its vapor forming a dense fog with hydrochloric acid. Its vapor irritates the mucous membranes very much, and when working with it induced violent headaches. The taste is acrid and pungent, and very persistent.

The alkaloid neutralizes acids completely; but the neutral solutions of acetate, sulphate and hydrochloride all become acid on evaporation from the loss of alkaloid. Oxalic acid is the only acid which yields a crystalline salt; but this is more or less mixed with free acid, from the loss of alkaloid by volatilization, an acid salt mixed with free oxalic acid being left. The acetate, sulphate and hydrochloride, when kept over strong sulphuric acid, dry up into hard, brittle, transparent, varnish-like substances, without the slightest trace of crystallization, even

after standing for months. All these compounds are very hygroscopic, especially the sulphate, and are very readily soluble in alcohol.

Neither concentrated hydrochloric acid nor nitric acid changes the color of the alkaloid in the cold, but when warmed, hydrochloric acid imparts a slightly reddish color and nitric acid turns it yellow. Concentrated sulphuric acid turns it brown after some time, immediately when warmed.

Platinic chloride does not precipitate an aqueous solution of the alkaloid (1:100 aq.) so long as the alkaloid is in excess, but when the solution has become neutralized, the addition of another drop of platinic chloride throws down a slight yellowish flocculent precipitate, which dissolves on heating but does not reappear on cooling; if a larger quantity of the platinic chloride be added, the precipitate still dissolves on the application of heat, but on cooling reappears in a crystalline condition. In a solution of 1 part of the hydrochloride of the alkaloid to 50 of water, a precipitate similar to the above is thrown down, and if heated a part redissolves, the undissolved portion turns to an orange-yellow color and becomes crystalline—the dissolved salt also crystallizes only on cooling. Under the microscope the crystals appear to have the form of the octahedron, or combinations of that with other forms belonging to the cubical system. More dilute solutions of the hydrochloride are not precipitated by platinic chloride.

In an aqueous solution of 1 part of the alkaloid to 100 water: Mercuric chloride throws down a white cheesy precipitate insoluble in excess of the precipitant. Copper sulphate a light green precipitate insoluble in an excess of the alkaloid. A few drops of gold chloride give a reddish-white precipitate, which disappears on shaking; a larger quantity gives a persistent flocculent reddish-white precipitate. Tannic acid gives a grayish-white precipitate easily soluble in hydrochloric acid. The double iodide of mercury and potassium gives a heavy white crystalline precipitate.

The alkaloid behaves very like nicotina with picric, phosphomolybdic and metatungstic acids; the addition of picric acid throws down a yellow precipitate soluble in hydrochloric acid. Phosphomolybdic acid forms a yellowish-white amorphous precipitate, insoluble in cold dilute hydrochloric acid, easily and completely dissolved on warming. The precipitate with nicotina is a dirty yellowish-white, amorphous, insoluble in cold dilute hydrochloric acid, soluble when warmed, but apparently not so readily as is the precipitate from the piturie alkaloid,

some white flakes being left undissolved. Metatungstate of sodium forms with both piturina and nicotina a white amorphous precipitate, soluble only in much dilute hydrochloric acid when warmed.

When iodine dissolved in ether is added to an ethereal solution of the alkaloid, the fluid becomes brownish-red and turbid; after a short time yellowish-red needles are deposited, the mother liquor being yellow; these crystals are easily soluble in alcohol, yielding a brownish-red solution; when the alcoholic solution is evaporated at the ordinary temperature, indistinct needles and oily drops are left behind. When this alcoholic solution is treated with caustic soda in the cold, a smell similar to that of iodoform is emitted, not that of the alkaloid; from the nicotina compound nicotina is liberated, according to Wertheim ("Watts' Dictionary of Chemistry," vol. iv, p. 47). The iodine compound of piturie melts at about 110°C., that of nicotina at 100°C.

From coniina, piturina is distinguished by its aqueous solution not becoming turbid on heating nor by the addition of chlorine water. It differs from anilin by not being colored by chloride of lime; it differs from picolin in specific gravity (picolin being only ·9613 at 0°C.); from pyridin by its reaction with copper sulphate, the precipitate $Cu(OH)_2$ produced by pyridin with copper sulphate redissolves in an excess of the precipitant; and it appears to be distinguished from nicotina by its reactions with platinic chloride, gold chloride, iodine and mercuric chloride, also by Palm's test. According to Palm ("Russische Zeitschrift für Pharmacie," i, 4 and Husemann's "Pflanzenstoffe"), nicotina when gently warmed with a little hydrochloric acid of 1·12 sp. gr. turns violet, and on the addition of a little strong nitric acid the color changes to a deep orange. The only sample of nicotina to be obtained in Sydney yielded the latter part of the above test very well; the orange being very stable, the violet color was not so well marked. The piturina does not change color at all, but when more heat is applied it becomes yellow.

The composition of the alkalaid was found to be C_6H_8N, which formula requires

		Theory.	Found.
C_6	= 72 =	76·59 per cent.	76·56 per cent.
H_8	= 8 =	8·51 "	8·48 "
N	= 14 =	14·90 "	14·94 "
	94	100·00	99·98

To confirm this formula, a platinum double salt was prepared in the

usual manner. The crystals so obtained were orange-red octahedra, fairly soluble in warm water, but very easily soluble when even a trace of the free alkaloid is present; partly soluble in alcohol, but insoluble in ether. To insure, as far as possible, uniformity of composition, the platinum salts were always prepared from the same portion of alkaloid with the same solution of platinic chloride, and as much as possible under the same circumstances; notwithstanding this the percentages of platinum and of chlorine obtained were never the same for the salts prepared at different times, neither did they fit in or correspond with the above-mentioned formula. The amount of chlorine was too small for the usual proportion of 1 Pt to 6 Cl met with in the normal double salts of platinum; in some cases it was even less than 1 : 5. The amount of platinum was determined in twenty-three cases upon salts prepared at ten different times, but from the same substance and with the same platinic chloride; the amount of Pt varied from 34·15 per cent. to 38·40 per cent.; seven analyses yielded between 35·35 and 35·55 per cent. Pt. Nine determinations of chlorine were made, and they varied from 31·32 to 36·86 per cent. Cl. The platinum salt is therefore clearly not of uniform composition, or else very unstable; it undergoes decomposition with loss of chlorine during evaporation, even when conducted under the desiccator without the aid of heat.

The mercuric chloride double salt, prepared by adding an excess of saturated solution of mercuric chloride to a solution of the hydrochloride of the alkaloid, crystallized well in rhombic plates and prisms; the double salt was crystallized from boiling water, dried at 100°C., and the amount of mercury and chlorine determined in it by two analyses, giving as a mean 63·175 and 24·620. The formula $(C_6H_8N)_2HCl+5HgCl_2$ requires 63·31 per cent. Hg and 24·72 per cent. Cl, while the corresponding compound of nicotina, $C_{10}H_{14}N_2$, $HCl+5HgCl_2$, would require 64·37 per cent. Hg and 25·15 per cent. Cl. Besides nicotina is said to form under the same circumstances a double salt containing 4 $HgCl_2$ instead of 5 $HgCl_2$. (*Vide* Watts' "Dictionary of Chemistry," vol. iv, p. 47.)

The above two analyses appear to make it probable that the true formula of the alkaloid is $(C_6H_8N)_2$ or $C_{12}H_{16}N_2$, *i. e.* double that yielded by its ultimate analysis, but much importance cannot, of course, be attached to such a compound as $(C_6H_8N)_2HCl+5HgCl_2$, in which the amount of alkaloid present is so very small.

0·2986 gram of the alkaloid required 18·5cc. $\frac{1}{10}$ normal sulphuric acid, a corresponding amount to that required by nicotina, to form $(C_{10}H_{14}N_2)_2H_2SO_4$; the molecular weight of nicotina being 162, 0·0162 $\times 18{\cdot}5 = 0{\cdot}2997$ instead of 0·2986.—*Phar. Jour. and Trans.*, April 2, 1881.

PRACTICAL NOTES FROM FOREIGN JOURNALS.

BY THE EDITOR.

Preparations of Peptone.—A. Petit recommends digesting 1 kilo of finely cut beef, freed from fat and tendons, with 6 liters of water, containing 24 grams HCl, at a temperature not exceeding 50°C., and with frequent agitation. A sufficient quantity of pepsin (the author has found 10 grams of his pork pepsin sufficient) is added and the digestion continued for 12 hours, when the liquid is strained, cooled and passed through a moistened filter. The filtrate which is not precipitated is carefully neutralized with sodium bicarbonate, and, by means of a water-bath, evaporated to dryness. On an average 250 grams of dry peptone will be obtained. The evaporation may be discontinued when the liquid has obtained the density of 25°B. (sp. gr. 1·208), when it contains nearly 50 per cent of peptones. This is the pepsino-chlorhydric peptone.

Pepsino-tartaric peptone is prepared as above from 1 kilo lean beef, 10 grams pepsin, 10 liters water and 150 grams tartaric acid; the filtered liquor is divided into two equal parts, one of which is exactly neutralized with potassium bicarbonate, after which the other half is added; the mixture is cooled and, after the separation of the cream of tartar, decanted and evaporated.

The dose of peptone is about 1 gram, and it may be given either enclosed in wafer capsules or, on account of its hygrometric properties, it may be kept it small glass tubes, and for use dissolved in broth or other aliments.

The following preparations are recommended:

Elixir of Peptone.—Dissolve peptone 5 grams in water 20 grams, add good wine 40 grams, sugar 25 grams and alcohol 10 grams. A tablespoonful contains 1 gram of peptone.

Syrup of Peptone.—Water 30 grams, sugar 60 grams, peptone 5 grams, tincture of orange peel 5 grams. Dissolve without heat.

Wine of Peptone.—Dissolve peptone 5 grams in Malaga wine 95 grams.

Mercuric Peptone is a mixture of peptone, mercuric chloride and sodium chloride, made in such proportions that the mercury is no longer precipitated by alkalies. Triturate together corrosive sublimate 1 gram, sodium chloride 2 grams and dry peptone 1 gram, dissolve in the smallest possible quantity of water, filter, evaporate in vacuo to complete dryness and again triturate well; the product dissolves in distilled water without leaving any residue. It is given in pills containing 0·04 gram of mercuric peptone, equal to 0·01 gram of corrosive sublimate. For hypodermic use mercuric peptone 4 gram is dissolved in distilled water 100 grams; the solution contains 1 per cent. of corrosive sublimate.—*Rép. de Phar.*, May, 1881, p. 213–216.

Preservation of Juices and Alimentary Substances.—Mr. Campion, of Beauvais, has constructed an apparatus for the preservation of fermentable substances, which are first heated by means of a water-bath to between 60 and 80°C. for the purpose of destroying the ferment present, and by atmospheric pressure are then forced into a bottle from which the air has been previously removed by means of an air-pump, after which the bottle is stoppered. The apparatus is easily operated and occupies little space. The juices of asparagus, mulberries, quinces, etc., as well as syrups, have been perfectly preserved in this manner for more than a year.—*Bull. Soc. Phar. Bordeaux*, 1881, p. 24–27.

Preservation of Solution and Syrup of Ferrous Iodide.—Carles recommends the addition of a few per cent. of hydrated sulphide of iron to Dupasquier's solution of ferrous iodide, whereby the latter is preserved for an indefinite time. A solution which from oxidation has become colored is rendered colorless again by agitation for a short time with ferrous sulphide.

According to Carles, the syrup is best preserved by the addition of a little citric acid, of which 1·5 gram will be sufficient for 1,300 grams of the syrup.—*Bull. Soc. Phar. du Sud-Ouest.*

Ferrous Sucrocarbonate.—In the preparation of Vallet's mass with cane sugar, C. Tanret obtained a syrupy mass interspersed with opaque crystals of a brown color, the lateral faces being inclined at an angle of 79·40°. The crystals have the spec. grav. 1·85 and the composition $(C_{12}H_{22}O_{11})_3(Fe_2CO_3)_2$. They are decomposed by neutral solvents of sugar, ferrous carbonate being precipitated.—*Jour. Phar. Chim.*

Gelatinization of Infusion of Menyanthes.—An infusion of buckbean, Menyanthes trifoliata, to which cane sugar has been added, gelatinizes in a few days, but remains liquid if free from sugar. An

infusion of buck-bean was precipitated by alcohol, the washed precipitate dissolved in water, and the solution divided into two parts, one of which, after being mixed with simple syrup, gelatinized, while the other remained fluid. The infusion, precipitated by alcohol, was freed from alcohol by moderate heating and diluted with water to its original bulk; it now retained its fluidity in the presence and absence of sugar. The removal of the pectin compound by alcohol, therefore, prevents the gelatinization of this and probably also of other infusions. —*Phar. Ztg.*, 1881, No. 34, p. 253.

Testing of Peru Balsam.—A. Doescher proposes to digest 2 gm. of the balsam with 10 gm. of petroleum benzin, and to evaporate 50 drops of the clear benzin solution upon a watch crystal. Pure Peru balsam leaves a colorless oily residue, which on being mixed and gently heated with 5 drops of commercial nitric acid, acquires a yellow color. If the balsam be adulterated with 10 per cent. of storax, the residue on treatment with HNO_3 turns greenish-blue and finally dirty green-yellow; the same color, but clearer, is obtained with a balsam containing 10 per cent. of colophony. If Grote's test be applied (agitating 3 drops of the balsam with 2 cc. of officinal ammonia water), the sample containing rosin yields an emulsion with thick and lasting foam, and gradually becomes thick, mostly gelatinous. The emulsion-like mixture from the balsam containing storax has a thin, rapidly disappearing foam and does not become thick or gelatinous.—*Phar. Ztg.*, 1881, No. 32, p. 238.

Testing of Butter.—Hehner's process ("Amer. Jour. Phar.," 1878, p. 257), was modified by O. Ditsch in the weighing of the isolated fatty acids after melting them together with a known quantity of wax, washing with water and drying. T. Salzer observed that in this way too high figures are obtained, but that by remelting the mixture twice with 6 parts of water, all the soluble fatty acids are removed.—*Ibid.*, No. 23, p. 170.

Lubricating Mixture.—Mignet de la Véga proposes the following: Melt together 60 kilos of castor oil with 10 k. of animal fat and 20 k. of vegetable oil, such as rape-seed or cotton-seed oil, add 20 k. of grain meal and boil for 30 minutes.—*Les Corps Gras Industr.*, vii, 211; *Chem. Ztg.*, No. 16, p. 209.

Laundry Starch.—Dr. J. Gantter has examined three samples of laundry starch (Glanzstärke) with the following results:

	Water.	Borax.	Starch (difference).
No. 1,	29·80	32·37	37·83 per cent.
No. 2,	29·94	41·04	29·22 "
No. 3,	29·95	21·00	56·04 "

Nos. 1 and 2 contained wheat starch and were perfectly soluble in hot water; such a product may be obtained either by strongly heating starch under pressure for some time and then powdering it finely with borax; or starch is boiled with concentrated borax solution, the resulting liquid is evaporated to dryness and the residue reduced to a fine powder.

No. 3 contained rice starch, dissolved in water only after prolonged boiling and was evidently a mechanical mixture of ordinary rice starch with finely powdered borax.

On heating starch with water and borax, a nearly clear solution is obtained, which penetrates the fabric immersed in it, so that starch together with borax is deposited not only upon but likewise in the fibres. Too large a quantity of borax would render the fabric brittle. The above mixtures should therefore be used only in connection with a larger quantity of ordinary starch.—*Phar. Post*, 1881, No. 9, pp. 170–172.

MEMOIR OF WILSON H. PILE, M.D.

Read before the College at a stated meeting, June 27, 1881.

Wilson Hunt Pile was born in Philadelphia, October 12th, 1808; he was the eldest of the four children of William and Sarah Pile. At the age of six years he attended a school in Lombard Street above Fifth, of which John Owen was master and Thomas Smiley and —— Goodfellow were ushers; among his classmates were a number who have left a record well known as prominent citizens.

Through the kindness of his early and life-long friend, Dr. Ruschenberger, we are able to trace his business career by his correspondence with him.

About the year 1824 he commenced learning the apothecary business in the shop of Elisha Crowell, at the corner of Fifth and South streets.

Dec. 14, 1826. He writes: "I have left the store on South street for one on Lombard street."

Dec. 20, 1827. "I have left Mr. Bigonett; hoping to get another situation soon."

Sept. 9, 1828. "I am engaged with William Hodgson, Jr., on Arch street, near Tenth street."

He remained with Wm. Hodgson, Jr., until the fall of 1829, when he engaged with Thomas Evans, at the northeast corner of Third and Spruce streets.

April 22, 1830. He writes: "I have erected in the shop a "*shocking affair*," which *settles* the nerves of no small number of customers daily, and affords amusement to all."

Mineralogy and entomology were attractive studies to him about this time, and reference is made to them in his correspondence.

When the automatic chess player was attracting public attention, he writes, Nov. 14, 1830, "I went lately to see him, and examined him very closely. When I came home I began and finished a small model of him in the same proportions, together with a man of like proportions, to be concealed within; the whole about 4 x 6 inches. With this model I can exhibit the same manner of opening and closing the doors (exactly as Maalzel, the owner, does with the original) and yet have space within for my man. I have convinced several; Mr. Schulze, who works for Maalzel, has the model at present, for the purpose of showing it to him. The idea is not *quite* original, having seen a description of him in an encyclopedia, or a supposition how a person could be concealed, but my model differed somewhat from this."

April 10, 1831. "I have been thinking seriously of studying medicine—at least, I have determined to attend a summer course on surgery and anatomy."

Shortly after, he writes: "I have taken tickets for a summer course, as follows: Hopkinson, on Anatomy; Randolph, on Surgery; Griffiths, on Materia Medica; B. H. Coates, on Practice, and Bache, on Chemistry."

He speaks of Dr. Randolph in a way which leads to the belief that he was his preceptor.

Jan. 3, 1832. "I have had a fine opportunity to study clinical practice during the past fall, on my own person, in a case of hæmoptysis (of which attack he gives the details); was treated by Dr. Evans by free venisection, etc. I have left Thomas Evans and the *wulgar* 'pothecary shop."

He now took up the study of medicine as a profession, and graduated at the University of Pennsylvania in March, 1833. His inaugural essay was "Malaria."

Soon after graduating he settled in Orwigsburg, Schuylkill county, to pursue the practice of his profession. On the 18th of June, 1833, he was married at that place to Miss Jeannette Shultz, previously of Philadelphia.

From Orwigsburg he writes: "I have also an apothecary store, but the Dutchmen about here believe it to be Pandora's box, and would rather eat a bucket of sourcrout than take an ounce of sal epsom."

Not meeting with success at Orwigsburg he removed, in November, 1834, to Pidgeontown, White Marsh, Montgomery county, Pa., on account, as he writes, "of the health and poverty of the inhabitants" of his former place of residence.

From Pidgeontown Dr. Pile removed to Philadelphia, and taught in the Lombard Street School for Colored Children, and afterwards in the Northeast Public School (Key's alley), where he remained for eight or nine years.

While engaged in this school he lectured on Physics, Electricity, etc. As a lecturer, his manner is described as earnest, and his method clear and definite, his enunciation distinct and his language appropriate to the subject and to the capacity of his audience.

About 1846 he opened a store at Passyunk road and German street; about one year after he removed to the northeast corner of Passyunk road and Catharine street, where he remained for nearly ten years, when he removed to the northwest corner of the same streets, where the business was continued by him, with his son as his partner, up to the time of his death.

In 1857 Dr. Pile became a member of the Philadelphia College of Pharmacy, and in the same year was elected to the Board of Trustees of the College, a position which he continued to hold up to the time of his decease.

His first contribution to the "American Journal of Pharmacy" was in 1852, "On the Graduating of Hydrometers." The subject of weights, measures and graduated instruments for accurate observation was a favorite subject to him, and from observation he was gradually led to the manufacture of a number of specialties which acquired a high reputation.

For his hydrometers and specific gravity bottles he obtained a first class medal from the Franklin Institute, the judges reporting them "to be equal to any imported from Europe."

In October, 1875, he contributed his experience on the manufacture of dilute phosphoric acid, narrating the circumstances of an explosion which occurred during the operation, and which nearly cost him his life. This was the last of a number of valuable papers contributed by him to the JOURNAL.

In 1857 he was elected a member of the American Pharmaceutical Association, and during the remainder of his active life he took a great interest in its proceedings, and was present at nearly all of its meetings. While attending a meeting of the Association in Toronto, in September, 1877, he was stricken with paralysis of one side, an affliction which incapacitated him for farther active engagement in business life. From this time his health was precarious, but he continued to manifest his interest in pharmacy and chemistry by attending some of the meetings of the College, and by his conversation with his old associates.

A return of the attack which commenced in Toronto terminated his life on the 14th of May last, in the 73d year of his age.

The character of Dr. Pile cannot be better described than is done by his friend, Dr. Ruschenberger, in a note to the compiler of this memoir.

"Considering the narrow circumstances of his early life, and his comparatively slender means and opportunity of early education, his intellectual achievement is vastly greater than might have been reasonably anticipated.

"Besides his strictly professional attainments he acquired a very respectable knowledge of mineralogy and entomology. He spoke and wrote the German language with ease. He studied music in his youth, played the piano quite well, and sang ballads for the entertainment of the domestic circle.

"He was pleased to take part in what may be termed parlor theatricals, as a boy, a taste which was encouraged, probably, by association with his schoolmate, Edwin Forrest.

"The prominent parts of his natural character were perfect integrity, generosity, love of accuracy and truth in all things, cheerfulness often under trying conditions, and a very affectionate disposition. He was modest, unpretending in reference to his own abilities, and respectfully considerate of the rights, feelings and opinions of others. I have never been closely associated with any man, either in private or public

life, whose moral tone was higher or better, in my estimation, than that of Dr. Pile.

"From 1814, when we became intimate, until his death, 1881, more than sixty-six years, we have been friends when together, and correspondents while my official duty separated us, often for several years at a time."

Those who have been associated with Dr. Pile in business, or as a member of this College, can fully endorse what has been said by Dr. Ruschenberger, and add thereunto their testimony to his character as a man deeply impressed with the duties and responsibilities of a Christian life, endeavoring to live void of offence to his fellow-men, and steadfast in his faith as a Christian.

ROSE OIL, OR OTTO OF ROSES.

By CHARLES G. WARNFORD LOCK.

This celebrated perfume is the volatile essential oil distilled from the flowers of some varieties of rose. The botany of roses appears to be in a transition and somewhat unsatisfactory state. Thus the otto-yielding rose is variously styled *Rosa damascena*, *R. sempervirens*, *R. moschata*, *R. gallica*, *R. centifolia*, *E. provincialis*. It is pretty generally agreed that the kind grown for its otto in Bulgaria is the damask rose (*R. damascena*), a variety induced by long cultivation, as it is not to be found wild. It forms a bush, usually 3 to 4 feet, but sometimes 6 feet high; its flowers are of moderate size, semi-double, and arranged several on a branch, though not in clusters or bunches. In color they are mostly light red; some few are white, and said to be less productive of otto.

The utilization of the delicious perfume of the rose was attempted, with more or less success, long prior to the comparatively modern process of distilling its essential oil. The early methods chiefly in vogue were the distillation of rose water, and the infusion of roses in olive oil, the latter flourishing in Europe generally down to the last century, and surviving at the present day in the south of France. The butyraceous oil produced by the distillation of roses for making rose water in this country is valueless as a perfume, and the real otto was scarcely known in British commerce before the present century.

The profitable cultivation of roses for the preparation of otto is limited chiefly by climatic conditions. The odoriferous constituent of the otto is a liquid containing oxygen, the solid hydrocarbon or stearopten, with which it is combined, being absolutely devoid of perfume. The proportion which this inodorous solid constituent bears to the liquid perfume increases with the unsuitability of the climate, varying from about 18 per cent. in Bulgarian oil to 35 and even 68 per cent. in rose oils distilled in France and England. This increase in the proportion of stearopten is also shown by

the progressively heightened fusing point of rose oils from different sources; thus while Bulgarian oil fuses at about 61° to 64°F., an Indian sample required 68°F., one from the south of France 70° to 73°F., one from Paris 84°F., and one obtained in making rose water in London 86° to 89½°F. Even in the Bulgarian oil a notable difference is observed between that produced on the hills and that on the lowlands.

It is, therefore, not surprising that the culture of roses, and extraction of their perfume, should have originated in the East. Persia produced rose water at an early date, and the town of Nisibin, northwest of Mosul, was famous for it in the fourteenth century. Shiraz, in the seventeenth century, prepared both rose water and otto for export to other parts of Persia as well as all over India. The Perso-Indian trade in rose oil, which continued to possess considerable importance in the third quarter of the eighteenth century, is declining, and has nearly disappeared; but the shipments of rose water still maintain a respectable figure. The value, in rupees, of the exports of rose water from Bushire in 1879 was—4,000 to India, 1,500 to Java, 200 to Aden and the Red Sea, 1,000 to Muscat and dependencies, 200 to Arab coast of Persian Gulf and Bahrein, 200 to Persian coast and Mekran, and 1,000 to Zanzibar. Similar statistics relating to Lingah, in the same year, show—Otto: 400 to Arab coast of Persian Gulf and Bahrein, and 250 to Persian coast and Mekran. And Bahrein, Persian otto: 2,200 to Koweit, Busrah and Bagdad; rose-water: 200 to Arab coast of Persian Gulf, and 1,000 to Koweit, Busrah and Bagdad.

India itself has a considerable area devoted to rose gardens, as at Ghazipur, Lahore, Amritzur, and other places, the kind of rose being *R. damascena*, according to Brandis. Both rose water and otto are produced. The flowers are distilled with double their weight of water in clay stills; the rose water (*goolabi pani*) thus obtained is placed in shallow vessels, covered with moist muslin to keep out dust and flies, and exposed all night to the cool air or fanned. In the morning, the film of oil which has collected on the top is skimmed off by a feather, and transferred to a small phial. This is repeated for several nights, till almost the whole of the oil has separated. The quantity of the product varies much, and three different authorities give the following figures: (*a*) 20,000 roses to make one rupee's weight (176 grains) of otto; (*b*) 200,000 to make the same weight; (*c*) 1,000 roses afford less than two grains of otto. The color ranges from green to bright amber, and reddish. The oil (otto) is most carefully bottled; the receptacles are hermetically sealed with wax, and exposed to the full glare of the sun for several days. Rose water deprived of otto is esteemed much inferior to that which has not been so treated. When bottled it is also exposed to the sun for a fortnight at least.

The Mediterranean countries of Africa enter but feebly into this industry, and it is a little remarkable that the French have not cultivated it in Algeria. Egypt's demand for rose water and rose vinegar is supplied from Medinet Fayum, southwest of Cairo. Tunis has also some local reputation for similar products. Von Maltzan says that the rose there grown for otto is the dog-rose (*R. canina*), and that it is extremely fragrant, 20 lbs. of the flowers yielding about one drachm of otto. Genoa occasionally imports a

little of this product, which is of excellent quality. In the south of France rose gardens occupy a large share of attention, about Grasse, Cannes and Nice; they chiefly produce rose water, much of which is exported to England. The essence (otto) obtained by the distillation of the Provence rose (*R. provincialis*) has a characteristic perfume, arising, it is believed, from the bees transporting the pollen of the orange flowers into the petals of the roses. The French otto is richer in stearopten than the Turkish, 9 grams crystallizing in a liter of alcohol at the same temperature as 18 grams of the Turkish. The best preparations are made at Cannes and Grasse. The flowers are not there treated for the otto, but are submitted to a process of maceration in fat or oil, 10 kilograms of roses being required to impregnate 1 kilogram of fat. The price of the roses varies from 50 cents to 1 franc 25 cents per kilogram.

But the one commercially important source of otto of roses is a circumscribed patch of ancient Thrace or modern Bulgaria, stretching along the southern slopes of the central Balkans, and approximately included between the 25th and 26th degree of east longitude and the 42d and 43d degree of north latitude. The chief rose growing districts are Philippopolis, Chirpan, Giopcu, Karadshah-Dagh, Kojun-Tepe, Eski-Sara, Jeni-Sara, Bazardshik, and the centre and headquarters of the industry, Kazanlik (Kisanlik), situated in a beautiful undulating plain, in the valley of the Tunja. The productiveness of the last-mentioned district may be judged from the fact that, of the one hundred and twenty-three Thracian localities carrying on the preparation of otto in 1877—they numbered one hundred and forty in 1859—forty-two belong to it. The only place affording otto on the northern side of the Balkans is Travino. The geological formation throughout is syenite, the decomposition of which has provided a soil so fertile as to need but litte manuring. The vegetation, according to Baur, indicates a climate differing but slightly from that of the Black Forest, the average summer temperatures being stated at 82° F. at noon and 68°F. in the evening. The rose bushes flourish best and live longest on sandy, sun-exposed (south and southeast aspect) slopes. The flowers produced by those growing on inclined ground are dearer and more esteemed than any raised on level land, being 50 per cent. richer in oil, and that of a stronger quality. This proves the advantage of thorough drainage. On the other hand, plantations at high altitudes yield less oil, which is of a character that readily congeals from an insufficiency of summer heat. The districts lying adjacent to and in the mountains are sometimes visited by hard frosts, which destroy or greatly reduce the crop. Floods also occasionally do considerable damage. The bushes are attacked at intervals and in patches by a blight similar to that which injures the vines of the country.

The bushes are planted in hedge-like rows in gardens and fields, at convenient distances apart, for the gathering of the crop. They are seldom manured. The planting takes place in spring and autumn; the flowers attain perfection in April and May, and the harvest lasts from May till the beginning of June. The expanded flowers are gathered before sunrise, often with the calyx attached; such as are not required for immediate dis-

tillation are spread out in cellars, but all are treated within the day on which they are plucked. Baur states that, if the buds develop slowly, by reason of cool damp weather, and are not much exposed to sun heat when about to be collected, a rich yield of otto, having a low solidifying point, is the result, whereas, should the sky be clear and the temperature high at or shortly before the time of gathering, the product is diminished and is more easily congealable. Hanbury, on the contrary, when distilling roses in London, noticed that when they had been collected on fine dry days the rose water had most volatile oil floating upon it, and that, when gathered in cool and rainy weather, little or no volatile oil separated.

The flowers are not salted, nor subjected to any other treatment, before being conveyed in baskets on the heads of men and women, and backs of animals, to the distilling apparatus. This consists of a tinned-copper still, erected on a semicircle of bricks, and heated by a wood fire; from the top passes a straight tin pipe, which obliquely traverses a tub kept constantly filled with cold water, by a spout, from some convenient rivulet, and constitutes the condenser. Several such stills are usually placed together, often beneath the shade of a large tree. The still is charged with 25 to 50 lbs. of roses, not previously deprived of their calyces, and double the volume of spring water. The distillation is carried on for about one hour and a half, the result being simply a very oily rose water (*ghyul-suyu*). The exhausted flowers are removed from the still, and the decoction is used for the next distillation instead of fresh water. The first distillates from each apparatus are mixed and distilled by themselves, one-sixth being drawn off; the residue replaces spring water for subsequent operations. The distillate is received in long-necked bottles, holding about 1¼ gallon. It is kept in them for a day or two, at a temperature exceeding 59°F., by which time most of the oil, fluid and bright, will have reached the surface. It is skimmed off by a small, long-handled, fine-orificed tin funnel, and is then ready for sale. The last-run rose water is extremely fragrant, and is much prized locally for culinary and medicinal purposes. The quantity and qualitiy of the otto are much influenced by the character of the water used in distilling. When hard spring water is employed, the otto is rich in stearopten, but less transparent and fragrant. The average quantity of the product is estimated by Baur at 0·037 to 0·040 per cent.; another authority says that 3,200 kilograms of roses give 1 kilogram of oil.

Pure otto, carefully distilled, is at first colorless, but speedily becomes yellowish; its specific gravity is 0·87 at 72·5°F.; its boiling point is 444°F.; it solidifies at 51·8° to 60·8°F. or still higher; it is soluble in absolute alcohol and in acetic acid. The most usual and reliable tests of the quality of an otto are (1) its odor, (2) its congealing point, (3) its crystallization. The odor can be judged only after long experience. A good oil should congeal well in five minutes at a temperature of 54·5°F.; fraudulent additions lower the congealing point. The crystals of rose-stearopten are light, feathery, shining plates, filling the whole liquid. Almost the only material used for artificially heightening the apparent proportion of stearopten is said to be spermaceti, which is easily recognizable from its liability to settle down in a solid cake, and from its melting at 122°F., whereas

the stearopten fuses at 81·4°F. Possibly paraffin wax would more easily escape detection.

The adulterations by means of other essential oils are much more difficult of discovery, and much more general; in fact, it is said that none of the Bulgarian otto is completely free from this kind of sophistication. The oils employed for the purpose are certain of the grass oils (*Andropogon* and *Cymbopogon spp.*), notably that afforded by *Andropogon Schœnanthus*, called *idris-yaghi* by the Turks, and commonly known to Europeans as "geranium oil," though quite distinct from true geranium oil. The addition is generally made by sprinkling it upon the rose leaves before distilling. It is largely produced in the neighborhood of Delhi and exported to Turkey by way of Arabia; it is sold by Arabs in Constantinople in large bladder-shaped tinned-copper vessels, holding about 120 lbs. As it is usually itself adulterated with some fatty oil, it needs to undergo purification before use. This is effected in the following manner: The crude oil is repeatedly shaken up with water acidulated with lemon juice, from which it is poured off after standing for a day. The washed oil is placed in shallow saucers, well exposed to sun and air, by which it gradually loses its objectionable odor. Spring and early summer are the best seasons for the operation, which occupies two to four weeks, according to the state of the weather and the quality of the oil. The general characters of this oil are so similar to those of otto of roses—even the odor bearing a distant resemblance—that their discrimination when mixed is a matter of practical impossibility. The ratio of the adulteration varies from a small figure up to 80 or 90 per cent. The only safeguard against deception is to pay a fair price and to deal with firms of good repute, such as Messrs. Papasoglu, Manoglu & Son, Ihmsen & Co. and Holstein & Co., in Constantinople.

The otto is put up in squat-shaped flasks of tinned copper called *kunkumas*, holding from 1 to 10 lbs. and sewn up in white woolen cloths. Usually their contents are transferred at Constantinople into small gilded bottles of German manufacture for export. The Bulgarian otto harvest, during the five years 1867-71, was reckoned to average somewhat below 400,000 *meticals*, *miskals* or *midkals* (of about 3 dwt. troy), or 4,226 lbs. avoirdupois; that of 1873, which was good, was estimated at 500,000, value about £700,000. The harvest of 1880 realized more than £1,000,000, though the roses themselves were not so valuable as in 1876. About 300,000 *meticals* of otto, valued at £932,077, were exported in 1876 from Phillippopolis, chiefly to France, Australia, America and Germany.—*Phar. Jour. and Trans.*, April 30, 1881, from *Jour. Soc. Arts*, Feb. 11, 1881.

VARIETIES.

PULVIS ALUMINIS COMP. (Hebra.)—Prof. A. L. Duhring furnishes to the "Medical Bulletin," May, the following formula:

℞ Pulv. aluminis plumos. (asbestos), . . . ℥ii
Pulv. zinci oxidi, ... ℥iv
Pulv. rad. iridis, ... ℥ii
Pulv. amyli, ... ℥viii

M. S. Apply locally (in eczema).

TINCTURA JALAPÆ COMPOSITA S. TINCT. PURGGAS.—Jalap 80 p., turpeth root 10 p., scammony 20 p., alcohol, 60 prct., 960 p.; macerate for 10 days, express and filter. Dose, 15 to 60 grams. It is known in France as *Eau de vie allemande;* also as *Lavollcy' purgative elixir;* sweetened with sugar, it is the *Elixir antiglaireux de Guillié.—Dorvault.*

TONIC IN NERVOUS DEBILITY.—Tilct. cinchonæ comp. ℥iv, tinct. hydrastis ℥iii, acid. phosphoric. dilut. ℥i. Mix. Dose: a teaspoonful in water, three or four times a day.—*N. Y. Med. and Surg. Jour.*

BORACIC ACID FOR THE EYES.—The experiments made by Dr. Theobald with boracic acid, in certain ophthalmic diseases, having proved of marked advantage in its application, he was led to try it in affections of the eye attended with discharge, and has found it a most efficacious remedy. From its possessing only slight astringent power, he is disposed to attribute much of its good effects to its antiseptic properties, with which is combined a certain amount of sedative or anodine power, as shown in its operation in cases of scrofulous keratitis. He employs solutions of from two to four or more grains to the ounce, which are dropped into the eye three or four times a day.—*Oil and Drug News.*

SALICYLATED STARCH IN ECZEMA.—Kersch ("Wiener Medicinisches Blatt," No. 1, 1881), strongly recommends salicylated starch in the treatment of eczema. It is prepared by gradually mixing small quantities of pure starch with a two to three per cent. alcoholic solution of salicylic acid. When the starch has settled, the quantity of solution present should be sufficient to furnish a layer over it. The residual solution should then be poured off; the salicylated starch pressed in stout muslin and dried at a temperature of 176°F. The eczematous patches are first deprived of their scales by the use of a two per cent solution of carbolic acid and potash soap. Then dried with absorbent antiseptic cotton, subsequently moistened with a two per cent. alcoholic solution of salicylic acid and then thickly covered with the salicylated starch. The remedy, even allowing for Kersch's enthusiasm, seems to have acted well, and is worthy of more extended trial.—*Chicago Med. Review,* May 20.

AMERICAN PHARMACEUTICAL ASSOCIATION.

This Association adjourned last year to meet again on the fourth Tuesday (23d day) of August, 1881, at Kansas City, Missouri.

As this point is the farthest west that a meeting has been held, and is a prominent railroad center, it is expected that a large gathering of pharmacists will take place, and many new members from beyond the Alleghanies join the Association.

The Local Secretary, Wm. T. Ford, reports that arrangements are being made with the various railroads for reduction in rates, and the Local Committee have secured a place for the Exhibition which promises to be very fine.

A trip to Colorado and Utah or New Mexico is in contemplation at much less than the ordinary cost, which, with the interesting reports of the

various committees and original papers in answer to queries, should induce the attendance of all who can possibly leave home.

Further particulars will be given in the circular of the Secretary, John M. Maisch, Philadelphia, who will also mail blank forms of application to those intending to become members.

JAMES T. SHINN, *President.*

MINUTES OF THE COLLEGE.

PHILADELPHIA, June 27, 1881.

A stated meeting of the Philadelphia College of Pharmacy was held at the College Hall, Charles Bullock, First Vice President, in the chair. 14 members present.

The minutes of the annual meeting were read and, on motion, approved.

The minutes of the Board of Trustees for April, May and June were also read by Thomas S. Wiegand, and, on motion, adopted.

Charles Bullock, Chairman of the Committee on Deceased Members, read a memoir of Dr. Wilson H. Pile, a member of the College, who died in this city on the 14th of May, 1881. The memoir, which was, on motion of Mr. Wiegand, referred to the Publication Committee, will be found on page 362 of this number of the JOURNAL.

Professor Remington and others spoke of the high regard entertained for the deceased, of his willingness to assist all those who were seeking knowledge, and especially upon the subjects of Specific Gravity and the Hydrometer, which were his specialties. He was a great friend and advocate of the College, and was ever found ready to assist in every undertaking that was calculated to elevate its character or promote its interest.

Thomas S. Wiegand read the following notice: "John S. Erben died on the 7th day of May, 1881. In the spring of 1842 the deceased began to learn the drug and apothecary business with his brother the late Henry G. Erben, at the corner of Twelfth and Vine streets. In the year 1857 he succeeded him, and continued the business successfully till his death. He was earnest, independent and justly esteemed for his integrity and honorable dealing."

Professor Maisch brought to the notice of the meeting the deaths of John Abraham, of Liverpool, and John Mackay, of Edinburgh, both of whom were corresponding members of this College. Their obituary notices will be found in the June number of the JOURNAL for this year.

On motion of William B. Webb, the Building Committee were authorized to make such repairs to the roof of the College building as may be found necessary to insure its safety and security.

On motion of Professor Remington the chair appointed a committee, consisting of Messrs. William C. Bakes, James T. Shinn, Thomas S. Wiegand and William E. Krewson, to make arrangements for a reception of the members of the College and others interested on Tuesday, September 27th.

The following gentlemen were elected delegates to the Annual Meeting

of the American Pharmaceutical Association, which meets in Kansas City in August next, with power to fill all vacancies which may occur, viz.: Messrs. Prof. J. P. Remington, Charles A. Heinitsh, Joseph L. Lemberger, George W. Kennedy and Charles Bullock.

To the Convention of Teaching Pharmaceutical Colleges, to be held at the same time and place, as delegates, with power to fill vacancies, Messrs. Charles Bullock, Prof. J. M. Maisch and Prof. J. P. Remington were elected.

Then, on motion, adjourned.

WILLIAM J. JENKS, *Secretary.*

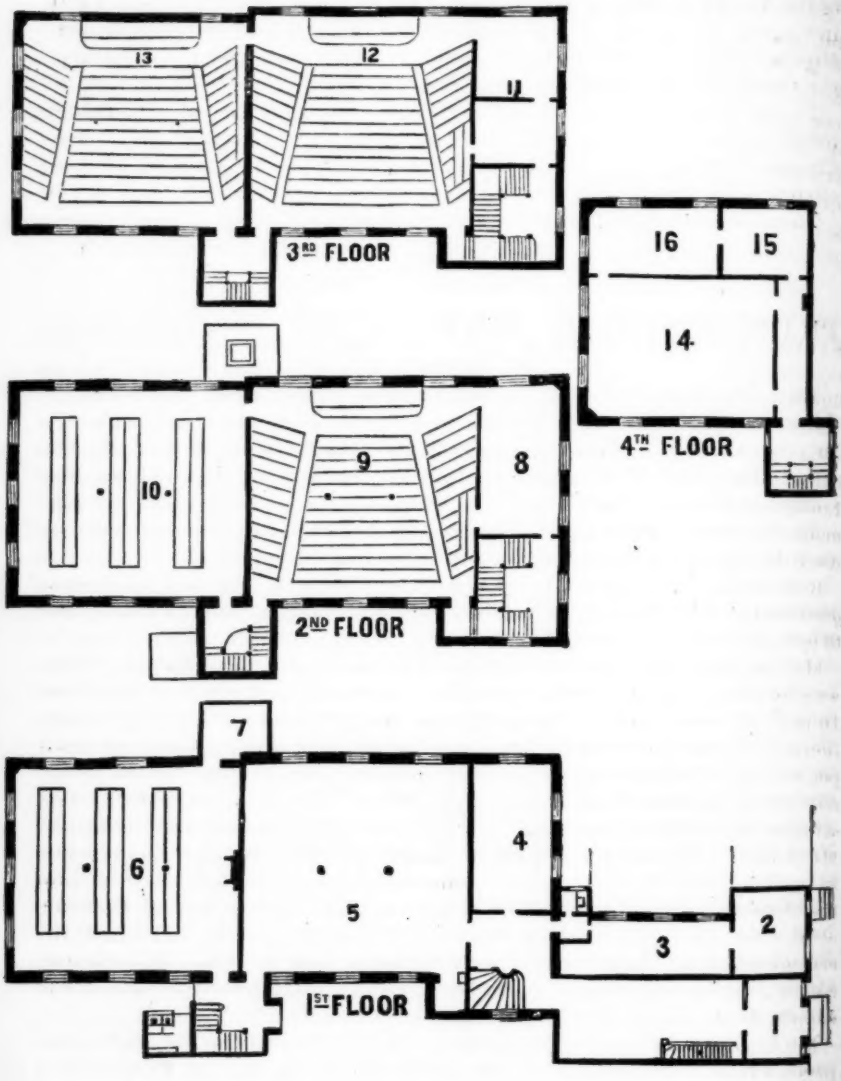
PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

PHILADELPHIA COLLEGE OF PHARMACY.—In the May number of the JOURNAL, p. 258, we have given a description of the improvements now in progress at this College; the annexed ground plans will render this description more intelligible, the portions marked 6, 10, 13 and 4th floor comprising the new building.

In the early history of the College the professors devoted a portion of each lecture hour to a review of the preceding lecture by questions put to the students. Subsequently, as the classes grew in size, and methods of instruction improved, an afternoon was set apart for this purpose; and when the graded course of instruction was adopted the reviews were left to former graduates and to the Alumni Association. The Board of Trustees have now authorized the professors each to appoint an assistant, whose duty it is, besides aiding the professor in preparing the lecture, to quiz those students who desire it upon their knowledge of the previous lectures, for which service a small fee is to be paid. The assistants selected by the professors, and confirmed by the Board of Trusteess are the following graduates of this College: John E. Cook, materia medica and botany; C. Fred. Zeller, pharmacy, and Henry Trimble, chemistry.

MASSACHUSETTS COLLEGE OF PHARMACY.—At the annual meeting, held June 6th, the following officers were elected for the ensuing year: President, Benj. F. Stacey; Vice-Presidents, Joel S. Orne and Solomon Carter; Recording Secretary, Henry Canning, Ph.G.; Corresponding Secretary, Geo. F. H. Markoe; Treasurer, Thos. Doliber, Ph.G.; Auditor, John C. Lowd, Ph.G.; Trustees—S. A. D. Sheppard, Ph.G.; Geo. F. Dinsmore, Ph.G.; Freeman H. Butler, Ph.G.; Edw. S. Kelley, Ph.G.; Wm. F. Sawyer, J. Thos. Leary, Ph.G.; Wm. W. Bartlett, Ph.G.; Silas S. Bradford, Ph.G.

NEW YORK COLLEGE OF PHARMACY.—At a special meeting the following gentlemen were elected to constitute the Board of Pharmacy of New York for the next three years: Starr H. Ambler, Ph.G.; Prof. Walter de F. Day, M.D.; William Baker, M.D ; Theobald Frohwein, Ph.G.; Benjamin E. Hays, M.D.



GROUND PLANS OF THE BUILDING OF THE PHILADELPHIA COLLEGE OF PHARMACY.

SCALE 40 FEET TO AN INCH.

First Floor—1, College Entrance. 2, Journal Office. 3, Actuary's Office. 4, Library. 5, Museum. 6, Chemical Laboratory. 7, Office Prof. Anal. Chemistry.

Second Floor—8, Cabinet of Professor of Pharmacy. 9, Pharmaceutical Lecture Room. 10, Pharmaceutical Laboratory.

Third Floor—11, Cabinet of Professor of Materia Medica. 12, Materia Medica Lecture Room. 13, Chemical Lecture Room.

Fourth Floor—14, Zeta Phi Room. 15 and 16, Alumni and Zeta Phi Alpha Rooms.

ST. LOUIS COLLEGE OF PHARMACY.—At the annual meeting, held April 25th, the following officers were elected for the ensuing year: President, F. W. Sennewald; Vice President, Chas. Gietner; Recording Secretary, E. P. Walsh; Corresponding Secretary, W. C. Boehm; Treasurer, Solomon Boehm; Board of Trustees—Chas. Bang, George Noll, H. E. Hoelke, W. B. Addington. The various reports were read and approved. The new State law of Missouri relating to the practice of pharmacy was taken up and discussed in all its bearings, the debate being quite animated, showing that the members are in earnest to protect the interests of the profession and of the public.

ALUMNI ASSOCIATION OF THE MASSACHUSETTS COLLEGE OF PHARMACY.—At the meeting held June 2d, Prof. Davenport showed and explained the use of a *densimeter*, for obtaining the specific gravity of any liquid by direct weighing, and without any calculation.

Mr. Sheppard stated that in making *syrup of iodide of iron* the quality of the iron used had a great deal to do with the success of the process. He had obtained very much better results with soft than with hard iron. Mr. Lowd and other members preferred the iron in the form of clean turnings, made for the purpose. The turnings seemed to be so disintegrated as to be more readily acted upon than smooth iron wire.

Remarks were made by various members showing that the dark *paregoric*, containing extract of liquorice, was still largely called for, and had to be kept.

Mr. Durkee showed some *medicinal pencils*, and explained how they were made and the trouble he had had in devising good working formulas. In making alum pencils the alum was melted in its water of crystallization, cooled till it would just run and was tough and stringy, and then poured into intra-uterine suppository moulds; these were opened while still warm, because if left until cold it was impossible to remove them. The samples shown were hard, translucent, and did not readily chip or break. Mr. Sheppard spoke of a method for making them easily from the crystals by rubbing them upon a piece of sandpaper laid upon a flat surface, and the President recommended for that purpose the new pencil sharpeners, consisting of a revolving disk covered with sandpaper, against which the crystal might be placed, and rapidly rubbed into any shape. Mr. Durkee, continuing his remarks, spoke of other pencils, particularly of sulphate of copper, which were hard to make and hard to keep.

Mr. Chase mentioned an expeditious way for *removing old labels* from prescription or other bottles. He wetted the face of the label and held it an instant in any convenient flame; the heated water penetrated the label and allowed it to be removed at once.

The President showed some very large *crystals of sugar*, which he had removed from a bottle of syrup of saffron that had been standing undisturbed for a long time. One of them was over two inches in length and about an inch in diameter.

ALUMNI ASSOCIATION OF THE SAINT LOUIS COLLEGE OF PHARMACY.—At the scientific meeting, held on the evening of June 21st, at the College rooms, a lecture was delivered by Dr. O. H. Wall upon the subject of Trichinæ. Dr. Wall had brought a number of specimens, and the interest of the lecture was heightened by the microscopic views afforded to the audience. Especially fine plates were some which showed trichinæ encapsuled in human flesh.

PENNSYLVANIA PHARMACEUTICAL ASSOCIATION.—The fourth annual meeting was held at the Common Council chamber in the city of Williamsport, at 4 o'clock P.M., June 14th, President G. W. Kennedy in the chair, Dr. J. A. Miller, Secretary. The association was welcomed be Mayor Keller, and Mr. T. J. Macmahon and Prof. P. W. Bedford, of the New York State Pharmaceutical Association, were invited to the privileges of the floor. The President's annual address, which contained a number of excellent suggestions, was listened to with great attention and referred to a committee for consideration and report. The reports of the Secretary, Executive Committee and Treasurer were presented, the latter showing a balance on hand of $575.11. An Auditing Committee and committees on exhibition and on the time and place of next meeting were appointed and 38, and subsequently 68, new members were elected. Pending the nomination of officers for the ensuing year it was resolved that nominations be made in the open meeting, and that no one be eligible to President unless having previously served at least one year as Vice President. The following were then elected: President, Geo. A. Kelly, Pittsburg; Vice Presidents, Alonzo Robbins, Philadelphia, and Jesse B. Duble, Williamsport. The Secretary, Treasurer and Executive Committee were re-elected.

At the evening session the new officers took their seats, after which committee reports were called up. Owing to the death of the chairman of the Committee on Legislation and Trade Interests, no report was received from this committee, but reports were read from the Committees on Adulteration and Sophistication, on Papers and Queries, on Ethics, and on Local and Private Formulas. The code of ethics reported was discussed by sections and unanimously adopted. It is as follows:

CODE OF ETHICS.

Preamble: The members of the Pennsylvania Pharmaceutical Association, considering it necessary that some mutual understanding should exist in regard to the moral principles guiding them in their profession, hereby agree upon the following Code of Ethics:

I. We accept the *U. S. Pharmacopœia* as our standard and guide for all official preparations, and recognize a variance from its rules only in exceptional cases, where sufficient authority has proven some other process more reliable to attain the same end.

This section is not intended to interfere with the dispensing of prescriptions or medicines ordered in accordance with foreign pharmacopœias.

II. Although not a legitimate part of our business, custom and the necessity of the times warrant us in keeping the proprietary medicines of the day, yet, out of regard to the medical profession and for the protection of the public, we earnestly recommend all pharmacists, when called upon for an opinion of their merits, to discourage their use, and neither to advertise nor permit their names to be used in advertising such medicines.

III. Recognizing the value of alcohol as a therapeutic agent, and the propriety of its being dispensed as such by pharmacists, yet deploring the wide-spread evil resulting from its indiscriminate use in its hundred insidious forms, we condemn any attempt to make it a prominent feature of our business as unprofessional; and we denounce the loose practice of allowing it to be used on the premises, in any shape, as a beverage, as degrading, and we urge upon pharmacists the duty of exercising a conscientious care in dispensing a drug liable to such dangerous abuse.

IV. We discountenance all secret formulas between physicians and pharmacists, and consider it our duty to communicate such to one another, when requested.

V. We distinctly repudiate the practice of allowing physicians a percentage on their prescriptions as derogatory to both professions.

VI. We will endeavor, as far as it lies in our power, to refrain from compromising the professional reputation of physicians, and we expect the same comity from them.

VII. Since the professional training of the pharmacist does not include those branches which enable the physician to diagnose and treat disease, we should in all practicable cases decline to give medical advice, and refer the applicant to a regular practitioner.

VIII. The growing demands of the age require that those who follow the profession of pharmacy should be educated to a higher standard. Therefore we consider it our duty, individually and collectively, to encourage the advancement of knowledge in our profession generally, and particularly by stimulating our assistants to attend the lectures of a college of pharmacy, and by aiding and assisting them to do so.

IX. Considering it expedient that some rule should be adopted to enforce the provisions of our code, we hereby agree, if any just cause of its violation be found against a member of this Association, to bring the case before a special or the next general meeting of the Association, when the accused, after being heard in his own defense, may be expelled by a two-thirds vote of all the members present.

The third session, held on the morning of June 15th, was chiefly devoted to the reading of papers, the first of which was by Mr. C. L. Lochman, of Bethlehem, on the *Prevention of Mistakes in Dispensing Poisons.* The author recommended, in the first place, order—by separating all dangerous articles from those of an indifferent nature—the former, it is suggested, to be kept on the right- and the latter on the left-hand side of the store, prescription counter or stock room; accuracy of weights and scales; cleanliness of all implements and apparatus; care in scanning the signs used in the prescription, and the dose of all—notably the potent medicines ordered, and in correctly and sufficiently labeling all medicines, are regarded as among the most important safeguards.

A paper by Dr. H. Pursell, of Bristol, treated of the purgative properties of that part of *Resin of Podophyllum soluble in Water.* By treating the resin with 3 parts of water at 150°F. 4 per cent. of extract soluble in water was obtained, while water at 60°F. took up 6 per cent. Both extracts proved inefficient in doses of 1 grain, but purged effectively, attended with some griping, in doses of 2 grains.

For concealing the objectionable valerian odor in *Elixir of Valerianate of Ammonium*, Mr. W. M. Thomson very properly recommends the addition of ammonia to slight alkalinity; as a flavor, oil of bitter almonds is often used, and the oil of pear (amyl-acetic ether?) recommended by the author.

An essay on *The Therapeutic Properties of Rhamnus purshiana* was read by Dr. L. Wolff, of Philadelphia. The conclusions arrived at are that cascara sagrada is, in moderate doses, a useful mild laxative of some cholagogue action, and in larger doses decidedly cathartic, and that an addition of mandrake or other substances, with the view of increasing its cathartic action, seems totally superfluous.

An excellent and thoroughly digested paper on *The Effect of the Wholesale Manufacture of Pharmaceutical Preparations upon the Proper Education and Training of the Pharmacists of the Future* was read by Mr. William L. Turner, of Philadelphia. While giving full credit to the skill manifested by many, and in some rare instances the high degree of merit attained, yet it is antagonistic to the best interests of pharmacy, present and future, and should be discountenanced and discouraged by individual enterprise and associated effort as an insidious enemy, whose gradual approach and close environment will ultimately reduce what we now regard and take pride in, as a profession, to a subordinate trade, a petty traffic.

Equally interesting and exhaustive was the discourse on *The Proper Training of Apprentices* by Mr. William B. Thompson, of Philadelphia. It is impossible to give an abstract of the arguments and propositions, of the character of which, however, a fair conception may be formed from the following closing sentences: "It doubtless is, in many instances, for the want of the personal interest and the kind of training that we have endeavored to indicate, that so many young men, assuming to be druggists, are found so illy qualified for the duties and responsibilities of their calling; this class drift aimlessly over our country and, after a restless moving from place to place, settle finally down into low-rate positions as confirmed underlings, preferring to lead a life of ennui before the counter, rather than a useful one of activity behind it. The world is apt to form its estimate of a man by his success; the elements of character needed to produce such results are numerous; they are seldom if ever born in man; they are rather determined by the circumstances which surround him and by energy. Give the circumstances the most favorable opportunities, and give to this energy the help it needs at times to stimulate and encourage it, and the rising generation of our profession will possess the way to a successful future and mark the path with brilliant achievements."

Mr. Charles T. George read a paper on *The Comparative Value of Commercial Extracts of Beef.* The results obtained were as follows:[1]

[1] Dr. B. C. Niederstadt reports, in *Archiv d. Phar.*, 1881, March, p. 196, the following results with

Johnston's fluid beef (7 analyses)		and with the	Fray Bentos extract (10 analyses):
44·00	per cent. water,	13·2 —29·2	per cent. water,
5·8 — 7·2	per cent. nitrogen,	2·60— 9·04	per cent. nitrogen,
24 —28·25	per cent. proteids insoluble in alcohol (albumin, etc.),	49·5 —68·7	per cent. organic substance,
22 —2)	per cent. extract soluble in alcohol,	50·7	per cent. extract soluble in alcohol,
9·2 —10·34	per cent. ash, containing	10·5 —21·4	per cent. ash, containing
	32 5—34·0 per cent. potassa,		30·1—32·5 per cent. potassa,
	21·0—23 3 per cent. phosphoric acid.		36·5—38·0 per cent. phosphoric acid.

The smaller amount of nitrogen and the larger amount of water in Johnston's preparation are about compensated for by the presence of the proteids and compounds directly nutritive.

	Liebig's Extract.	Valentine's Meat Juice.	Johnston's Fluid Beef.
Dry fibre,	———	———	33 per cent.
Dry extract,	80 per cent.	33·3 per cent.	30 per cent.
Water,	20 per cent.	66·6 per cent.	37 per cent.
Ash,	14 per cent.	7 per cent.	10 per cent.
Price per drachm of dry extract,	4½ cents.	16 cents.	6½ cents.

A short paper on *Emulsions* was read by Mr. William M. Thomson, advocating the process of M. Gerrard (see "Amer. Jour. Phar.," 1880, p. 560).

An investigation into *The Asserted Antiseptic Properties of Formic Acid*, made by Dr. L. Wolff, resulted in proving that this acid is only a feeble antifermentive and of no value whatever as an antiputrid agent.

The subject of *Accuracy in Scales and Weights* was reported on by Mr. George W. Stoeckel, of Reading, who regards improvement in this respect as very urgent. The same member presented also a statistical paper, showing that in 86 towns and cities in Pennsylvania, with a population of about 705,000, there were 1,176 physicians and 495 drug stores, of which number one did not deal in patent medicines and many dealt also in other articles.

The paper by Prof. Maisch on *The Stearopten of Buchu Oil* is published on page 331.

In a paper entitled *The Weight of a Liter of Water at Different Temperatures*, Mr. Gustavus Pile gives the following table, which takes into consideration the expansion of the flask, equal to ·014 cc. for each degree of temperature:

Temp.	Cub. cent.	Grains.	Temp.	Cub. cent.	Grains.
39°F.	1000	15432·3	65°F.	998·6	15410·7
45	999·9	15430·7	70	998·1	15403·0
50	999 8	15429·1	75	697·5	15393·7
55	999·5	15424 6	80	996·8	15382·9
60	999·1	15418·4	85	996·0	15370·6

From the interesting report on Unofficinal and Local Formulas, read by Mr. Charles T. George, we extract a few formulas:

Oleic Acid.—Dissolve dry white Castile soap 10 lbs., in 4 gal. of hot water, add, with constant stirring, sulphuric acid 30 oz.; decant the upper layer, wash it with warm water and dissolve in it, at a moderate heat, 10 oz. of finely powdered litharge; while still warm, pour the whole into 12 pints of deodorized benzin, and after 24 hours, pour off from the deposit of lead palmitate. Shake the clear filtrate well with 4 oz. of pure hydrochloric acid diluted with 4 pints of cold water, decant and filter the benzin solution of oleic acid, evaporate in an open dish, heat over a water bath until all odor of benzin has disappeared, wash with warm water and filter. The yield will be about 5 lbs.

Linimentum Saponis.—Dissolve camphor ℥ii, in alcohol Oii; add oleic acid ℥ii and oil of rosemary f℥ss; then gradually add sodium bicarbonate ℥v, and when effervescence has ceased, add water f℥vi and filter. It will not deposit in cold weather.

Elixir of Phosphorus.—Phosphorus gr.x, bromide of ethyl f℥x; dissolve

and add stronger alcohol f ℥viii and elixir of orange sufficient to make one gallon. Each drachm contains $\frac{1}{100}$ grain of phosphorus.

Elixir of Phosphorus, Quinia and Strychnia.—Dissolve strychnia 2½ gr. and sulphate of quinia 64 gr., with dilute sulphuric acid q. s., in elixir of phosphorus 1 pint.

Syrupus Aurantii Corticis Recentis.—Macerate for 8 days, 12 oz. of freshly grated orange peel in alcohol 20 oz. and water 5 pints; filter and dissolve without heat 10 lbs. of white granular sugar.

Syr. Limonis Cortic. Rec. may be made in the same manner.

Emulsion of Cod Liver Oil.—Irish moss 1 oz., water 1 pint; boil for 15 or 20 minutes, stirring constantly, and strain when cold. Gradually add, with constant stirring and beating, a mixture of cod liver oil 2½ pints, oil of bitter almonds 2 scruples and oil of wintergreen 6 drachms; when perfectly emulsified, add 12 fluidounces of glycerin and sufficient water to make the whole measure 5 pints. Salts soluble in water may be added, or other essential oils may be used.

Emulsion of Castor Oil.—Castor oil 1 pint, oil of wintergreen 2 drachms, glyconin 4 fluidounces, glycerin 6½ fluidounces, cinnamon water sufficient for 2 pints. Add the oils gradually to the glyconin, stirring constantly; when perfectly emulsified, add the glycerin and water.

Cologne Water.—Oil of neroli ℥i, oil of bergamot ℥iv, oil of rose ʒi, oil of coriander ʒii, oil of santal ʒii, extracts of vanilla, jasmin and musk of each ℥viii, extract of orris ℥xvi, benzoic acid (from the resin) ʒiv, deodorized alcohol Oxii, distilled water Oiii. Mix.

Orange Cologne.—Oil of neroli ʒii, oil of bergamot ʒiv, extract of jasmin ℥i, extracts of orange, musk and rose, each ℥iv, deodorized alcohol Oiiss, orange flower water Oss. Mix.

The extracts of *jasmin*, *orange* and *rose* are made by washing the pomade with deodorized alcohol. Extract of *vanilla* is made of vanilla 1 oz., sugar 2 oz., deodorized alcohol 1 pint. Extract of *musk* consists of musk 1 drachm, potassa solution 2 drachms and deodorized alcohol 1 pint. Extract of *orris* is made from orris root 4 lbs. and sufficient deodorized alcohol to obtain 4 pints of tincture; add 4 drachms pure sulphuric acid, shake occasionally and after two days add 2 oz. of barium carbonate, agitate and filter.

Professor Remington read a paper entitled *Apprentice or Drug Clerk.* After a historical inquiry into apprenticeship, giving an abstract of the Pennsylvania law of Sept. 29, 1770, and reading the indentures of a druggist's apprentice in Philadelphia of 100 years ago, the author referred to the present times and gave some sound advice relating to the selection, education and proper training of apprentices.

The Committee on the Next Annual Meeting reported that it be held at Altoona on the second Tuesday of June, 1882, which was adopted, and Mr. C. F. Randolph was elected Assistant Secretary.

Reports were also read from the Committee on the President's Address, and from the delegates to the American Pharmaceutical Association, and a committee was appointed to confer with the trade association of Philadelphia.

In the afternoon the members with their ladies made an excursion on the steamer *Minnie*, with a flat boat in tow, up the West Branch of the Susquehanna River to the Dodge saw mill, one of the largest in the country. The beautiful scenery along the river, the perfect machinery, among which an apparatus for turning logs, an endless chain used in jacking logs, etc., and the great "boom" extending for miles upwards, where the logs floating down the river are secured and assorted, were attractive and instructive novelties to most of those present.

The fourth and concluding session was held in the evening, when an official visit was paid to the exhibition room, and reports were read from several committees and delegations. The exclusion of improper articles from the exhibitions was referred to the Executive Committee for action at the next meeting. A resolution was passed advocating the organization of county societies to co-operate with the State Association, and several committees were appointed, among them one to demand the abrogation of the liquor tax and proprietary stamp duties as applying to pharmacists; also one to consider the steps necessary for the abolition of the annual patent medicine tax levied in Pennsylvania. Votes of thanks were passed to the authorities and citizens of Williamsport and to the Local Secretary, after which, at a late hour, the Association adjourned, those present repairing to the residence of Mr. E. A. Cornell, where another hour was pleasantly spent in social intercourse.

West Virginia State Pharmaceutical Associations.—The convention of pharmacists and druggists of West Virginia was largely attended, and met at Veteran Hall, in the city of Wheeling, in the forenoon, June 1st. Mr. Samuel Laughlin, of Wheeling, was elected temporary chairman and Mr. W. I. Boreman, of Parkersburg, secretary. Addresses were made by Mayor Egerter and by the chairman, and committees on credentials, on nominations and on constitution were appointed at the morning session.

In the afternoon, Governor Jackson was present and made an address, dwelling mainly on the pharmacy law recently passed in that State. On motion of Mr. Boggs, an invitation was extended to the ladies of the city, to the medical profession and to the Board of Public Works to attend the sessions. Reports of the Committee on Credentials and of the Committee on Constitution were read, discussed and adopted, after which the Nominating Committee reported the following names: President, S. Laughlin, Wheeling; Vice Presidents, Ed. L. Boggs, Charleston and D. C. Williams, Jr., Martinsburg; Secretary, W. I. Boreman, Jr., Parkersburg; Treasurer, C. D. Carney, Fairmont. Mr. Charles Moenkemoeller was appointed temporary assistant secretary, and a committee of five was charged with considering and reporting on the new pharmacy act. A number of invitations were received and accepted, and in the evening a reception was tendered to the members and guests at the residence of the chairman.

The second day was chiefly devoted to a discussion of the pharmacy act and a report was adopted urging it as the duty of the Commissioners of Pharmacy to modify, as far as possible, such of the technical requirements

as may be conceded without any violation of the law. The appointment of the standing committees and the passing of votes of thanks concluded the business before the Association, which will hold its next annual meeting in Wheeling on the first Tuesday in June, 1882. During the second day, a number of the industrial establishments of Wheeling were visited.

KENTUCKY STATE PHARMACEUTICAL ASSOCIATION. — The fourth annual meeting convened in the Louisville College of Pharmacy, May 18, the president, M. H. Webb, of Simpsonville, in the chair. After an address of welcome by Mr. J. A. Flexner, the president delivered his annual address, and the various officers and committees made their reports. Invitations were received and accepted for visiting the establishments of the Bremaker Moore Paper Company, the Newcomb Buchanon Distilling Company, the Pictet Artificial Ice Company and the Board of Trade. After the election of members and the reading of papers an adjournment was had until the next morning.

At the second session, resolutions relating to the death of J. J. Frost were adopted, and the draft of a pharmacy law was thoroughly discussed, which differs from the present law chiefly in applying to the entire State and not only to a portion thereof. Fraternal greetings were received by telegraph from the New York Pharmaceutical Association.

The following officers were elected: President, C. S. Porter, Eminence; Vice Presidents, T. E. Bruce, Lebanon, E. Scheffer, Jr., Louisville and P. R. H. Venable, Bardstown; Recording Secretary, W. G. White, Richmond; Corresponding Secretary, W. B. McRoberts, Stanford and Treasurer, Peter Nodler, Covington. After the election of the standing committees and the installation of the new officers, the Association adjourned to meet in Covington in May, 1882.

KANSAS PHARMACEUTICAL ASSOCIATION.—The annual meeting was held at Topeka, June 1st. President R. J, Brown, of Leavenworth, in the chair. F. E. Holliday, Secretary. It was decided, in pursuance to a call, that the special business of the annual meeting be postponed to an adjourned meeting to be held in Topeka, July 12, 1881. The report of the Committee on Queries was presented and a number of queries accepted by those present.

Considerable discussion took place on the qualifications of a druggist; what experience was necessary to qualify him for the business. Further discussion was postponed until the next meeting. George Leis reported progress on the proposed excursion for the American Pharmaceutical Association; the probable destination will be Santa Fe, N. M. The committee, which consists of George Leis and R. J. Brown, was continued.

Mr. H. K. Rowley made a brief report in regard to the test cases before the Supreme Court, and thought they would be decided by July 1st. No further business to transact, the Association adjourned until July 12th.

PHARMACY IN ALABAMA.—The Jefferson County Pharmaceutical Society, recently organized, has issued a call, signed by S. W. Gillespie and A.

L. Stollenwerck, for a meeting of the pharmacists and druggists of Alabama, to be held at Birmingham, August 9th, with the view of organizing a State Pharmaceutical Association.

EDITORIAL DEPARTMENT.

MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.—The preparations for this meeting, which is to convene in Kansas City, Mo., August 23, are nearly completed, and the circular of the Permanent Secretary will soon be issued. The Local Secretary, Mr. Wm. T. Ford, has effected arrangements with all the railroads centering in Kansas City to convey the members back from the place of meeting at a considerable reduction from the regular fare, and arrangements are contemplated for an excursion to the Rocky Mountains and other places West at a low rate. At a recent meeting of the Council, a plan has been agreed upon for a trip of the Eastern members to Kansas City, which, it is expected, will present many attractions. A large number of members from the Western States will doubtless be present, and the Atlantic States promise likewise to be well represented, so that a very profitable meeting may be expected.

COUNTY PHARMACEUTICAL SOCIETIES.—The Trade Association of Philadelphia Druggists has recently issued a circular to the pharmacists and druggists of the State, urging the organization of county societies, for the purpose of promoting the trade interests, preventing detrimental legislation, and co-operating with the State Pharmaceutical Association. At the recent meeting of the latter this subject received some attention, and was warmly supported by prominent pharmacists residing in different sections. We regard it as a move in the proper direction. The good which has been accomplished by the American Pharmaceutical Association is felt in the State associations, and these latter, it is to be hoped, will be instrumental in bringing the druggists and pharmacists of the different districts more closely together, and, in turn, be benefitted and strengthened by local societies, where meetings can be held more frequently.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

The Chemistry of Medicines, Practical. A Text and Reference Book for the Use of Students, Physicians and Pharmacists. With fifty original cuts. Second edition. By J. U. Lloyd, Professor of Chemistry and Pharmacy in the Eclectic Medical Institute of Cincinnati. Cincinnati: Robert Clarke & Co. 1881. 12mo, pp. 451. Price, in cloth, $2.75; leather, $3.25.

This is essentially a reprint of the work noticed by us on page 143 of the March number, and makes its appearance in a by far more attractive style, with new and improved wood-cuts, better letter-press, good paper, etc. Aided by his long practical experience, the author has produced a volume which will be practically useful to those for whose use it has been intended.

J. M. Nickell's Botanical Ready Reference. Especially Designed for Druggists and Physicians. Chicago, 1881. Pp. 268.

Upon the title-page and in the preface the author states that the book contains *all of the botanical drugs* known up to the present time, giving, also, *all* of their botanical, common, pharmacopœial and German common (in German) names and medical properties. This has been attempting too much, notwithstanding 2,465 names of plants are enumerated, of which, however, several are varieties, as is correctly stated, for instance for Rhus radicans. In several cases distinct species are designated as varieties, for instance Rheum compactum, and others are said to be varieties of Rh. palmatum. Some important names, like Rheum officinale, Garcinia morella, etc., have been omitted, and of several plants names which are considered rather obsolete have been selected, like Chironia instead of Erythræa centaurium; the latter, however, are found among the synonyms. On comparing the common names with those mentioned in the similar works by Pollock and Hobbs, a number of new ones are found, while, on the other hand, a number have been omitted which are mentioned in the others.

Considering the numerous difficulties in the way of such a compilation, the work before us must be regarded as a very creditable and a very useful one. The first part gives, in alphabetical and numerical order, the botanical name of the plant, followed by the common names, the part employed and the medical properties. Then follow several indexes, with references to the number of the article in the first part, namely, botanical names, including synonyms; pharmacopœial names, as used in the United States, Great Britain and Germany; German common names and English common names. Among the latter we are surprised to find the designation "carrion flower" applied to the aromatic Nepeta glechoma, and not to the Smilax herbacea, *Lin.* (peduncularis, *Muhl.*), which has such a disgusting odor.

The following reports have been received:

Report of the Board of Managers of the Pennsylvania Hospital, together with the Accounts of the Treasurer and Stewards. Philadelphia, 1881.

Report of the Managers of the State Lunatic Asylum at Utica, N. Y., for the Year 1880. Albany, 1881.

Report of Analytical and Other Work done on Sorghum and Cornstalks by the Chemical Division of the Department of Agriculture, July to December, 1880, under Direction of Hon. W. G. LeDuc, Commissioner, by Peter Collier, Chemist. Washington, 1881. 8vo, pp. 101.

OBITUARY.

DR. WILLIAM HENRY OSBORN, a prominent pharmacist of Baltimore, died in that city June 17th. The deceased had been for several years Vice President and Treasurer of the Maryland College of Pharmacy, and since 1870 a member of the American Pharmaceutical Association.